

Service Service Service

SDI PDP 2K7

S42AX-YD04 (42-inch HD, W2)

S42AX-YD08 (42-inch HD, W2 Plus)

S50HW-YD05 (50-inch HD, W2)

S50HW-YD07 (50-inch HD, W2 Plus)

Service Manual

Contents	Page
1. Technical Specifications, Connections, and Chassis Overview	2
2. Safety Instructions, Warnings, and Notes	9
3. Directions For Use	10
4. Mechanical Instructions	11
5. Service Modes, Error Codes, and Fault Finding	20
6. Block Diagrams, Test Point Overview, and Waveforms	58
7. Circuit Diagrams and PWB Layouts	59
8. Alignments	60
9. Circuit Descriptions, Abbreviation List, and IC Data Sheets	73
10. Spare Parts List	74
11. Revision List	74

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1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

- 1.1 PDP Overview
- 1.2 Serial Numbers
- 1.3 Chassis Overview

Notes:

- Figures can deviate due to the different model executions.
- Specifications are indicative (subject to change).

1.1 PDP Overview

Table 1-1 PDP overview

	PDP Type / Version	Model Name	H x V Pixel
1	42" HD W2	S42AX-YD04	1024 x 768
2	42" HD W2 Plus	S42AX-YD08	1024 x 768
3	50" HD W2	S50HW-YD05	1366 x 768
4	50" HD W2 Plus	S50HW-YD07	1365 x 768

1.1.1 42" HD W2

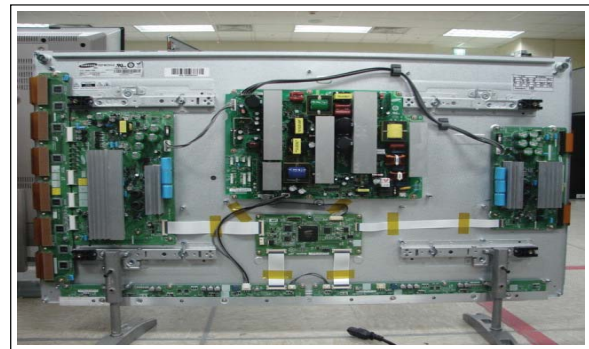


Figure 1-1 Rear view of plasma panel (42" HD W2)

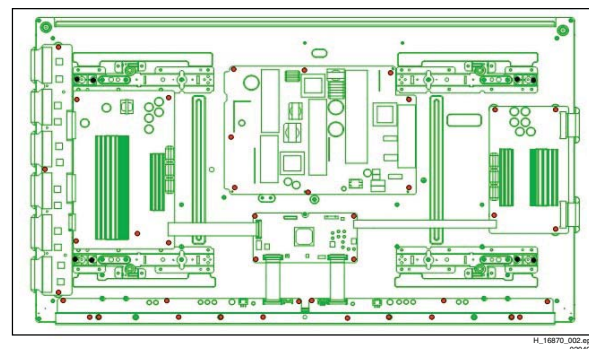


Figure 1-2 Location of mounting screws (42" HD W2)

Note:

- Black dot= screw 4x12 (n= 8).
- Red dot= screw 3x10 (n= 40).
- Screw torque 9.5 ± 0.5 kgf.cm.

No	Item	Specification 42" HD W2	
1	Pixel	1.024 (H) x 768 (V) pixels (1 pixel = 1 R,G,B cells)	
2	Number of Cells	3072 (H) x 768 (V)	
3	Pixel Pitch	0.912mm (H) x 0.693mm (V)	
4	Cell Pitch	R	Horizontal 0.304 mm Vertical 0.693 mm
		G	Horizontal 0.304 mm Vertical 0.693 mm
		B	Horizontal 0.304 mm Vertical 0.693 mm
5	Display size	933.89 (H) x 532.22 (V) mm	
6	Screen size	Diagonal 42" Colour Plasma Display Module	
7	Screen aspect	16:9	
8	Display colour	1073.7 million colours (10-bit)	
9	Viewing angle	Over 160 deg (angle with 50% and greater brightness perpendicular to PDP module)	
10	Dimensions	1000 (W) x 588.3 (H) x 65.3 (D) mm	
11	Weight	Module 3	About 17.5 kg
12	Vertical frequency Video/Logic Interface	60/50 Hz, LVDS	

1.1.2 42" HD W2 Plus

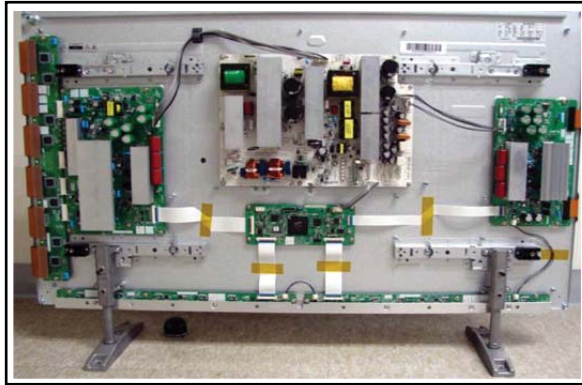
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Figure 1-3 Rear view of plasma panel (42" HD W2 Plus)

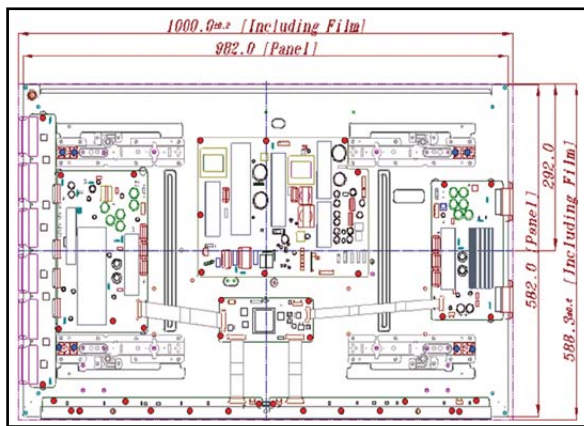
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Figure 1-4 Location of mounting screws (42" HD W2 Plus)

Note:

- Blue dot= screw 4x12 (n= 8).
- Red dot= screw 3x10 (n= 38).
- Screw torque 9.5 ± 0.5 kgf.cm.

No	Item	Specification 42" HD W2 Plus	
1	Pixel	1,024 (H) x 768 (V) pixels (1 pixel = 1 R,G,B cells)	
2	Number of Cells	3072 (H) x 768 (V)	
3	Pixel Pitch	0.912mm (H) x 0.693mm (V)	
4	Cell Pitch	R	Horizontal 0.304 mm Vertical 0.693 mm
		G	Horizontal 0.304 mm Vertical 0.693 mm
		B	Horizontal 0.304 mm Vertical 0.693 mm
5	Display size	933.89 (H) x 532.22 (V) mm	
6	Screen size	Diagonal 42" Colour Plasma Display Module	
7	Screen aspect	16:9	
8	Display colour	1073.7 million colours (10-bit)	
9	Viewing angle	Over 160 deg (angle with 50% and greater brightness perpendicular to PDP module)	
10	Dimensions	1000 (W) x 588.3 (H) x 65.3 (D) mm	
11	Weight	Module 3	About 17.5 kg
12	Vertical frequency Video/Logic Interface	60/50 Hz, LVDS	

1.1.3 50" HD W2

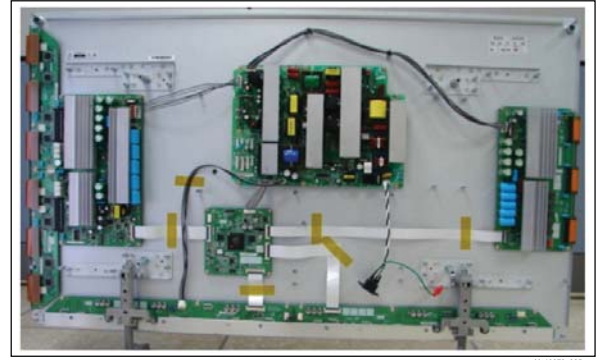
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Figure 1-5 Rear view of plasma panel (50" HD W2)

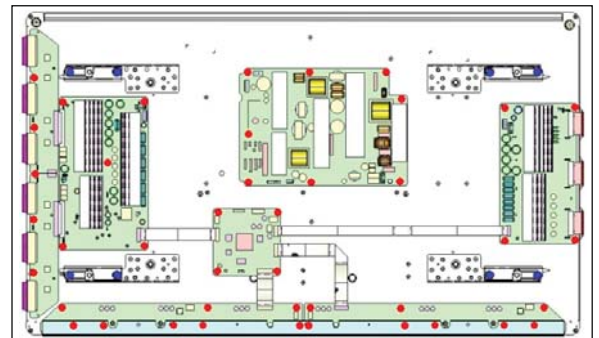
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Figure 1-6 Location of mounting screws (50" HD W2)

Note:

- Blue dot= screw 4x12 (n= 8).
- Red dot= screw 3x10 (n= 42).
- Screw torque 9.5 ± 0.5 kgf.cm.

No	Item	Specification 50" HD W2	
1	Pixel	1366 (H) x 768 (V) pixels (1 pixel = 1 R,G,B cells)	
2	Number of Cells	4,095 (H) x 768 (V) cells	
3	Pixel Pitch	0.810 mm (H) x 0.810 mm (V)	
4	Cell Pitch	R	Horizontal 0.270 mm Vertical 0.810 mm
		G	Horizontal 0.270 mm Vertical 0.810 mm
		B	Horizontal 0.270 mm Vertical 0.810 mm
5	Display size	1105.65 mm (H) x 622.08 mm (H)	
6	Screen size	Diagonal 50" Colour Plasma Display Module	
7	Screen aspect	16:9	
8	Display colour	1073.7 million colours (10-bit)	
9	Viewing angle	Over 160 deg (angle with 50% and greater brightness perpendicular to PDP module)	
10	Dimensions	1175 (W) x 682 (H) x 63.8 (D) mm	
11	Weight	Module 3	About 24.2 kg
12	Vertical frequency Video/Logic Interface	60/50 Hz, LVDS	

1.1.4 50" HD W2 Plus

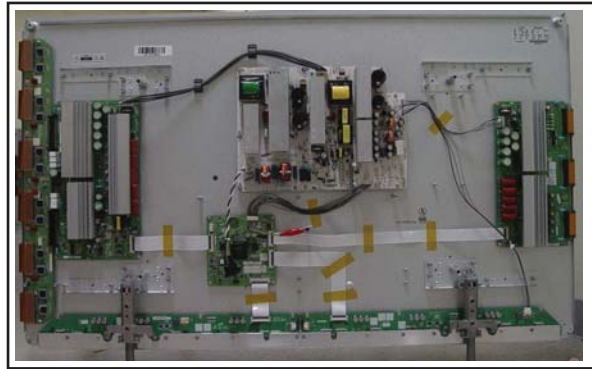
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Figure 1-7 Rear view of plasma panel (50" HD W2 Plus)

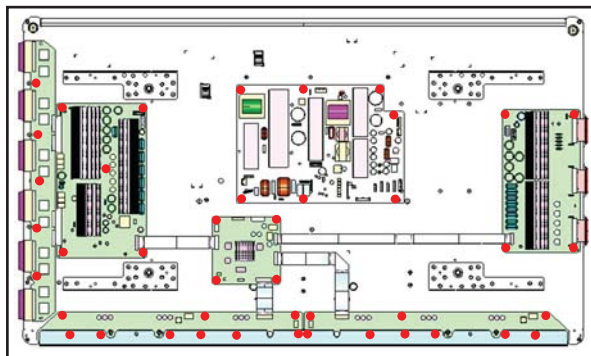
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Figure 1-8 Location of mounting screws (50" HD W2 Plus)

Note:

- Red dot= screw 3x10 (n= 43).
- Screw torque 9.5 ± 0.5 kgf.cm.

No	Item	Specification 50" HD W2 Plus	
1	Pixel	1,365 (H) x 768 (V) pixels (1 pixel = 1 R,G,B cells)	
2	Number of Cells	4095 (H) x 768 (V)	
3	Pixel Pitch	0.810mm (H) x 0.810mm (V)	
4	Cell Pitch	R	Horizontal 0.270 mm Vertical 0.810 mm
		G	Horizontal 0.270 mm Vertical 0.810 mm
		B	Horizontal 0.270 mm Vertical 0.810 mm
5	Display size	1105.65 (H) x 622.08 (V) mm	
6	Screen size	Diagonal 50" Colour Plasma Display Module	
7	Screen aspect	16:9	
8	Display colour	549.75 billion colours (13-bit)	
9	Viewing angle	Over 160 deg (angle with 50% and greater brightness perpendicular to PDP module)	
10	Dimensions	1175 (W) x 682 (H) x 63.8 (D) mm	
11	Weight	Module 1	About 22.3 kg
12	Vertical frequency Video/Logic Interface	60/50 Hz, LVDS	

1.2 Serial Numbers

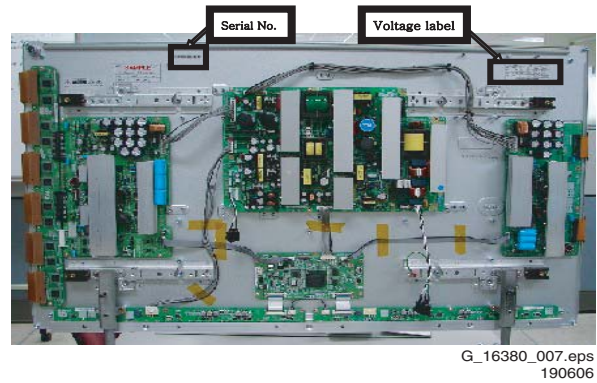
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Figure 1-9 Location of the serial number

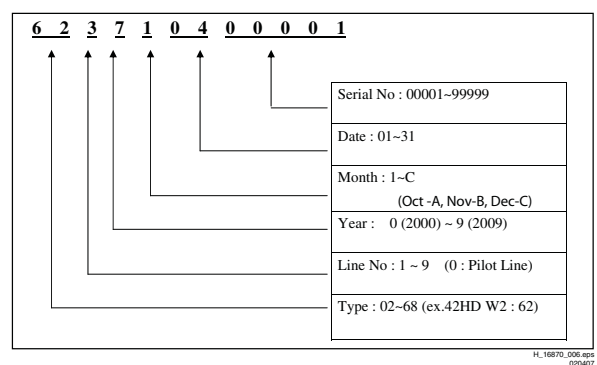
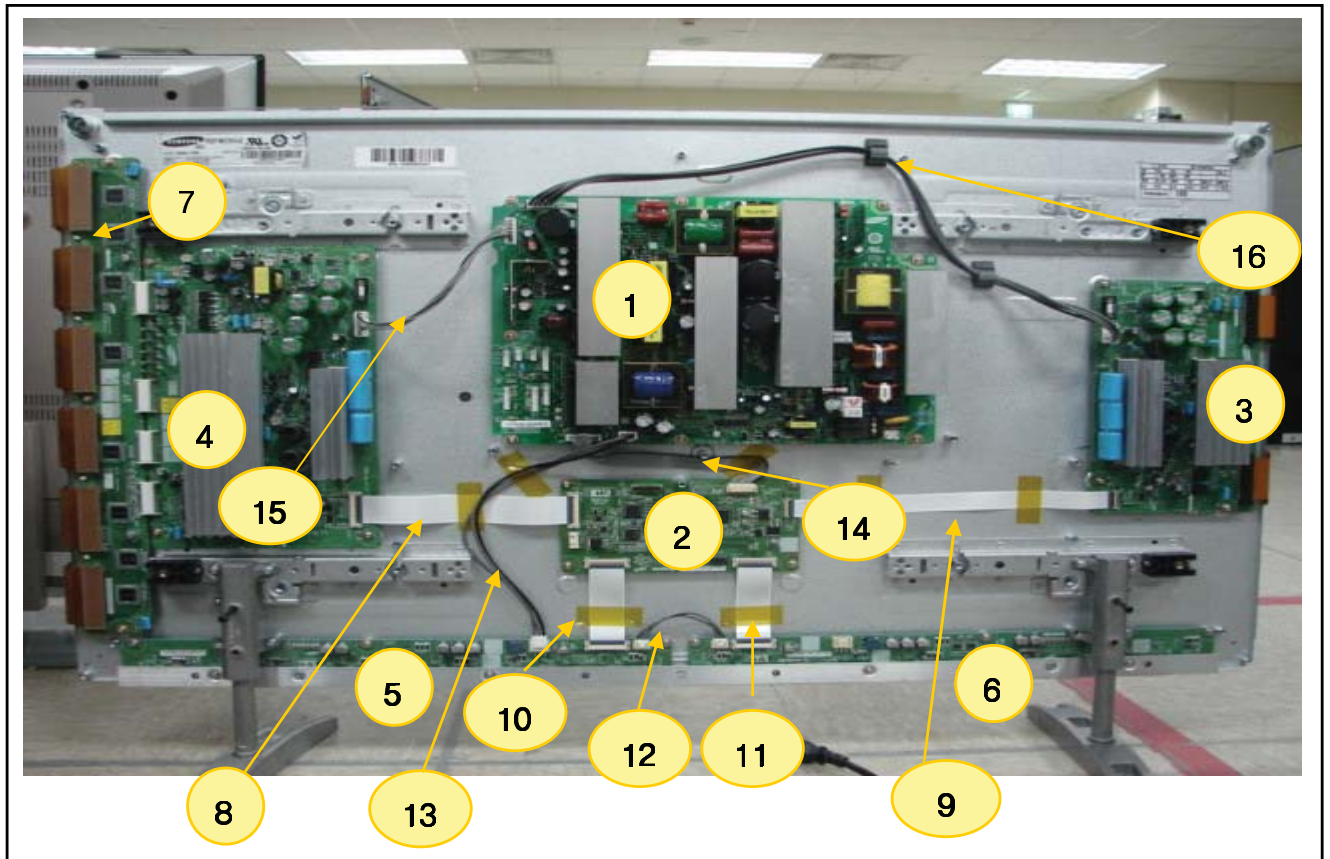
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Figure 1-10 Explanation of the serial number

1.3 Chassis Overview

1.3.1 42" HD W2



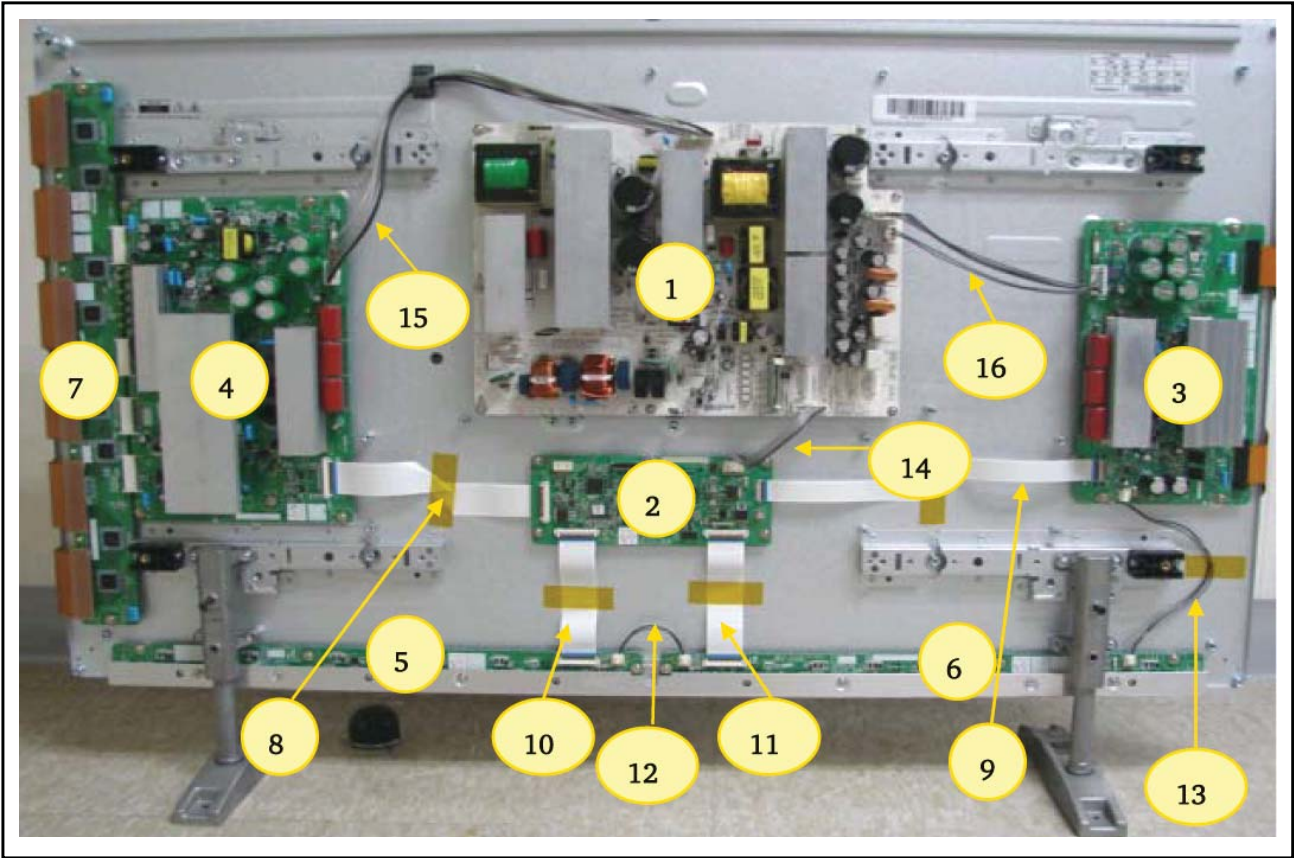
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Figure 1-11 PWB location (42" HD W2)

Table 1-2 PWB overview (42" HD W2)

No.	Location	Name
1	SMPS	SMPS
2	LOGIC-MAIN Board	Assy PWB LOGIC Main
3	X-MAIN Driving Board	Assy PWB X Main
4	Y-MAIN Driving Board	Assy PWB Y Main
5	LOGIC E BUFFER Board	Assy PWB Buffer
6	LOGIC F BUFFER Board	Assy PWB Buffer
7	Y-BUFFER Board	Assy PWB Buffer
8	LOGIC + Y-MAIN	FFC Cable-flat
9	LOGIC + X-MAIN	FFC Cable-flat
10	LOGIC + LOGIC BUF(E)	FFC Cable-flat
11	LOGIC + LOGIC BUF(F)	FFC Cable-flat
12	LOGIC BUF(E) + LOG. BUF(F)	Lead connector
13	SMPS + LOGIC BUF(E)	Lead connector
14	SMPS + LOGIC MAIN	Lead connector
15	SMPS + Y-MAIN	Lead connector
16	SMPS + X-MAIN	Lead connector

1.3.2 42" HD W2 Plus



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Figure 1-12 PWB location (42" HD W2 Plus)

Table 1-3 PWB overview (42" HD W2 Plus)

No.	Location	Name
1	SMPS	SMPS
2	LOGIC-MAIN Board	Assy PWB LOGIC Main
3	X-MAIN Driving Board	Assy PWB X Main
4	Y-MAIN Driving Board	Assy PWB Y Main
5	LOGIC E BUFFER Board	Assy PWB Buffer
6	LOGIC F BUFFER Board	Assy PWB Buffer
7	Y-BUFFER Board	Assy PWB Buffer
8	LOGIC + Y-MAIN	FFC Cable-flat
9	LOGIC + X-MAIN	FFC Cable-flat
10	LOGIC + LOGIC BUF(E)	FFC Cable-flat
11	LOGIC + LOGIC BUF(F)	FFC Cable-flat
12	LOGIC BUF(E) + LOG. BUF(F)	Lead connector
13	X-MAIN + LOGIC BUF(F)	Lead connector
14	SMPS + LOGIC MAIN	Lead connector
15	SMPS + Y-MAIN	Lead connector
16	SMPS + X-MAIN	Lead connector

1.3.3 50" HD W2

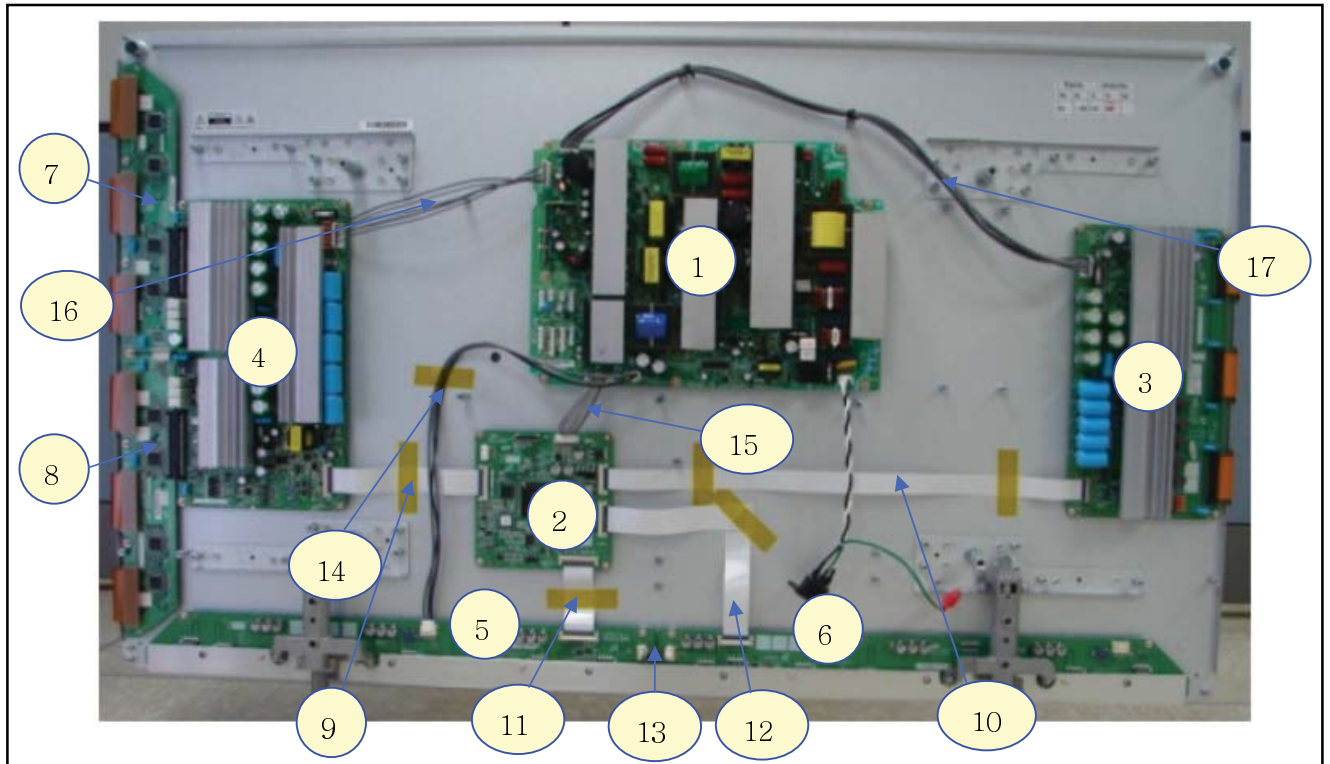
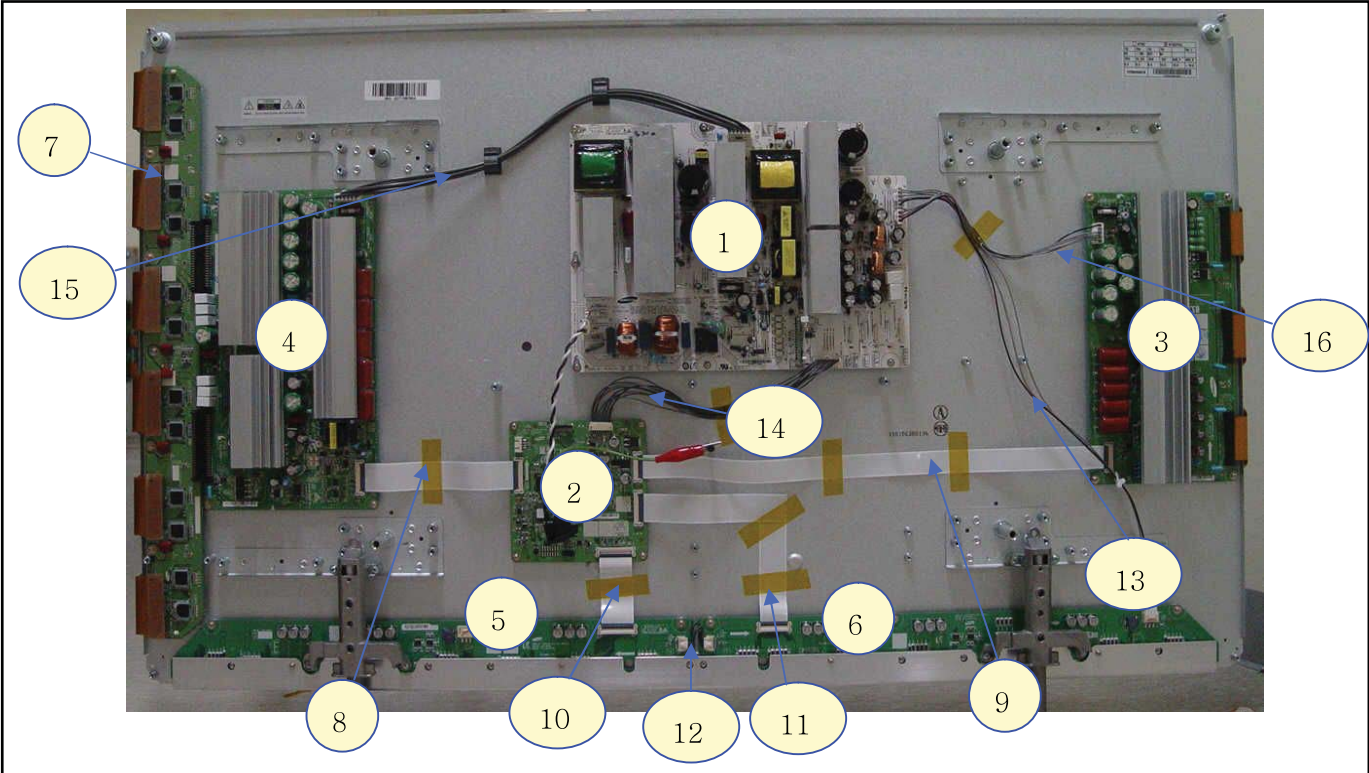
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Figure 1-13 PWB location (50" HD W2)

Table 1-4 PWB overview (50" HD W2)

No.	Location	Name
1	SMPS	SMPS
2	LOGIC-MAIN Board	Assy PWB LOGIC Main
3	X-MAIN Driving Board	Assy PWB X Main
4	Y-MAIN Driving Board	Assy PWB Y Main
5	LOGIC E BUFFER Board	Assy PWB Buffer
6	LOGIC F BUFFER Board	Assy PWB Buffer
7	Y-BUFFER (Upper) Board	Assy PWB Buffer
8	Y-BUFFER (Lower) Board	Assy PWB Buffer
9	LOGIC + Y-MAIN	FFC Cable-flat
10	LOGIC + X-MAIN	FFC Cable-flat
11	LOGIC + LOGIC BUF (E)	FFC Cable-flat
12	LOGIC + LOGIC BUF (F)	FFC Cable-flat
13	LOGIC BUF (E) + LOG. BUF (F)	Lead connector
14	SMPS + LOGIC BUF (E)	Lead connector
15	SMPS + LOGIC MAIN	Lead connector
16	SMPS + Y-MAIN	Lead connector
17	SMPS + X-MAIN	Lead connector

1.3.4 50" HD W2 Plus



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Figure 1-14 PWB location (50" HD W2 Plus)

Table 1-5 PWB overview (50" HD W2 Plus)

No.	Location	Name
1	SMPS	SMPS
2	LOGIC-MAIN Board	Assy PWB LOGIC Main
3	X-MAIN Driving Board	Assy PWB X Main
4	Y-MAIN Driving Board	Assy PWB Y Main
5	LOGIC E BUFFER Board	Assy PWB Buffer
6	LOGIC F BUFFER Board	Assy PWB Buffer
7	Y-BUFFER UP Board	Assy PWB Buffer
8	LOGIC + Y-MAIN	FFC Cable-flat
9	LOGIC + X-MAIN	FFC Cable-flat
10	LOGIC + LOGIC BUF(E)	FFC Cable-flat
11	LOGIC + LOGIC BUF(F)	FFC Cable-flat
12	LOGIC BUF(E) + LOG. BUF(F)	Lead connector
13	SMPS + LOGIC BUF(F)	Lead connector
14	SMPS + LOGIC MAIN	Lead connector
15	SMPS + Y-MAIN	Lead connector
16	SMPS + X-MAIN	Lead connector

2. Safety Instructions, Warnings, and Notes

Index of this chapter:

- 2.1 Handling Precautions
- 2.2 Safety Precautions
- 2.3 Notes

Notes:

- Only authorised persons should perform servicing of this module.
- When using/handling this unit, pay special attention to the PDP Module: it should not be enforced into any other way than next rules, warnings, and/or cautions.
- **"Warning"** indicates a hazard that may lead to death or injury if the warning is ignored and the product is handled incorrectly.
- **"Caution"** indicates a hazard that can lead to injury or damage to property if the caution is ignored and the product is handled incorrectly.

2.1 Handling Precautions

- The PDP module use high voltage that is dangerous to humans. Before operating the PDP, always check for dust to prevent short circuits. Be careful touching the circuit device when power is "on".
- The PDP module is sensitive to dust and humidity. Therefore, assembling and disassembling must be done in no dust place.
- The PDP module has a lot of electric devices. The service engineer must wear equipment (for example, earth ring) to prevent electric shock and working clothes to prevent electrostatic.
- The PDP module use a fine pitch connector which is only working by exactly connecting with flat cable. The operator must pay attention to a complete connection when connector is reconnected after repairing.
- The capacitor's remaining voltage in the PDP module's circuit board temporarily remains after power is "off". Operator must wait for discharging of remaining voltage during at least 1 minute.

2.2 Safety Precautions

2.2.1 Safety Precautions

- Before replacing a board, discharge forcibly the remaining electricity from the board.
- When connecting FFC and TCPs to the module, recheck that they are perfectly connected.
- To prevent electrical shock, be careful not to touch leads during circuit operations.
- To prevent the Logic circuit from being damaged due to wrong working, do not connect/disconnect signal cables during circuit operations.
- Do thoroughly adjustment of a voltage label and voltage-insulation.
- Before reinstalling the chassis and the chassis assembly, be sure to use all protective stuff including a nonmetal controlling handle and the covering of partitioning type.
- Caution for design change: Do not install any additional devices to the module, and do not change the electrical circuit design.
- For example: Do not insert a subsidiary audio or video connector. If you insert It, it cause danger on safety. And, if you change the design or insert, manufacturer guarantee will be not effect.
- If any parts of wire is overheats of damaged, replace it with a new specified one immediately, and identify the cause of the problem and remove the possible dangerous factors.
- Examine carefully the cable status if it is twisted or damaged or displaced. Do not change the space between

parts and circuit board. Check the cord of AC power preparing damage.

- Product Safety Mark: Some of electric or implement material have special characteristics invisible that was related on safety. In case of the parts are changed with new one, even though the Voltage and Watt is higher than before, the Safety and Protection function will be lost.
- The AC power always should be turned "off", before next repair.
- Check assembly condition of screw, parts and wire arrangement after repairing. Check whether the material around the parts get damaged.

2.2.2 ESD Precautions

There are parts, which are easily damaged by electrostatics (for example Integrated Circuits, FETs, etc.) Electrostatic damage rate of product will be reduced by the following technics:

- Before handling semiconductor parts/assembly, must remove positive electric by ground connection, or must wear the antistatic wrist-belt and ring (it must be operated after removing dust on it. It comes under precaution of electric shock).
- After removing the assembly, lay it with the tracks on a conductive surface to prevent charging.
- Do not use chemical stuff containing Freon. It generates positive electric that can damage ESD sensitive devices.
- You must use a soldering device for ground-tip when soldering or de-soldering these devices.
- You must use anti-static solder removal device. Most removal devices do not have antistatic which can charge a enough positive electric enough for damaging these devices.
- Before removing the protective material from the lead of a new device, bring the protective material into contact with the chassis or assembly.
- When handing an unpacked device for replacement, do not move around too much. Moving (legs on the carpet, for example) generates enough electrostatic to damage the device.
- Do not take a new device from the protective case until the it is ready to be installed. Most devices have a lead, which is easily short-circuited by conductive materials (such as conductive foam and aluminium)

2.3 Notes

A glass plate is positioned before the plasma display. This glass plate can be cleaned with a slightly humid cloth. If due to circumstances there is some dirt between the glass plate and the plasma display panel, it is recommended to do some maintenance by a qualified service employee only.

2.3.1 Safe PDP Handling

- The work procedures shown with the "Note" indication are important for ensuring the safety of the product and the servicing work. Be sure to follow these instructions.
- Before starting the work, secure a sufficient working space.
- At all times, other than when adjusting and checking the product, be sure to turn "off" the main POWER switch and disconnect the power cable from the power source of the display (jig or the display itself) during servicing.
- To prevent electric shock and breakage of PWBs, start the servicing work at least 30 seconds after the main power has been turned "off". Especially when installing and removing the Power Supply PWB and the SUS PWB in which high voltages are applied, start servicing at least 2 minutes after the main power has been turned "off".

- While the main power is “on”, do not touch any parts or circuits other than the ones specified. The high voltage Power Supply block within the PDP module has a floating ground. If any connection other than the one specified is made between the measuring equipment and the high voltage power supply block, it can result in electric shock or activation of the leakage-detection circuit breaker.
- When installing the PDP module in, and removing it from the packing carton, be sure to have at least two persons perform the work while being careful to ensure that the flexible printed-circuit cable of the PDP module does not get caught by the packing carton.
- When the surface of the panel comes into contact with the cushioning materials, be sure to confirm that there is no foreign matter on top of the cushioning materials before the surface of the panel comes into contact with the cushioning materials. Failure to observe this precaution may result in, the surface of the panel being scratched by foreign matter.
- When handling the circuit PWB, be sure to remove static electricity from your body before handling the circuit PWB.
- Be sure to handle the circuit PWB by holding the large parts as the heat sink or transformer. Failure to observe this

precaution may result in the occurrence of an abnormality in the soldered areas.

- Do not stack the circuit PWB. Failure to observe this precaution may result in problems resulting from scratches on the parts, the deformation of parts, and short-circuits due to residual electric charge.
- Routing of the wires and fixing them in position must be done in accordance with the original routing and fixing configuration when servicing is completed. All the wires are routed far away from the areas that become hot (such as the heat sink). These wires are fixed in position with the wire clamps so that the wires do not move, thereby ensuring that they are not damaged and their materials do not deteriorate over long periods of time. Therefore, route the cables and fix the cables to the original position and states using the wire clamps.
- Perform a safety check when servicing is completed. Verify that the peripherals of the serviced points have not undergone any deterioration during servicing. Also verify that the screws, parts and cables removed for servicing purposes have all been returned to their proper locations in accordance with the original

3. Directions For Use

Not applicable.

4. Mechanical Instructions

Index of this chapter:

- 4.1 Dis-assembling / Re-assembling
 - 4.1.1 Flexible Printed Circuit of Y-Buffer (Upper and Lower)
 - 4.1.2 Flat Cable Connector of X-main Board
 - 4.1.3 Assembling & Disassembling FFC and TCP Cables from their Connectors
 - 4.1.4 Exchange of LBE and LBF board - 42" HD W2
 - 4.1.6 Exchange of LBE and LBF board - 50" HD W2
 - 4.1.8 Exchange YB and YM board - 42" HD W2 & 42" HD W2 Plus
 - 4.1.9 Exchange YB and YM board - 50" HD W2 & 50" HD W2 Plus

4.1 Dis-assembling / Re-assembling

4.1.1 Flexible Printed Circuit of Y-Buffer (Upper and Lower)

- Dis-assembly: Pull out the FPC from the connector by holding the lead of the FPC with both hands.
- Re-assembly: Push the lead of the FPC with equal force on both sides into the connector.

Note: Be careful not to damage the connector pins during connecting.



Figure 4-1 Dis-assembly FPC of Y-buffer

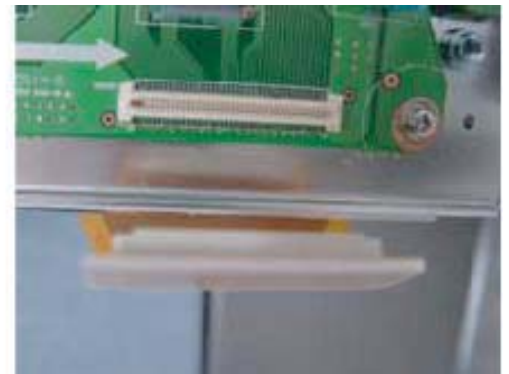


Figure 4-2 Re-assembly FPC of Y-buffer

4.1.2 Flat Cable Connector of X-main Board

- Dis-assembly:
 1. Pull out the clamp of the connector.
 2. Pull the Flat cable out, while pressing it down lightly.
- Re-assembly: Insert the Flat Cable into the connector, while pressing it down lightly until you hear a "Click".

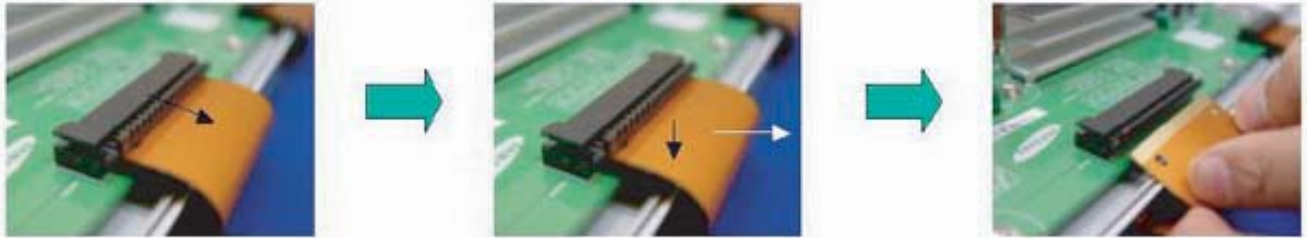


Figure 4-3 Dis-assembly FCC of X-main board

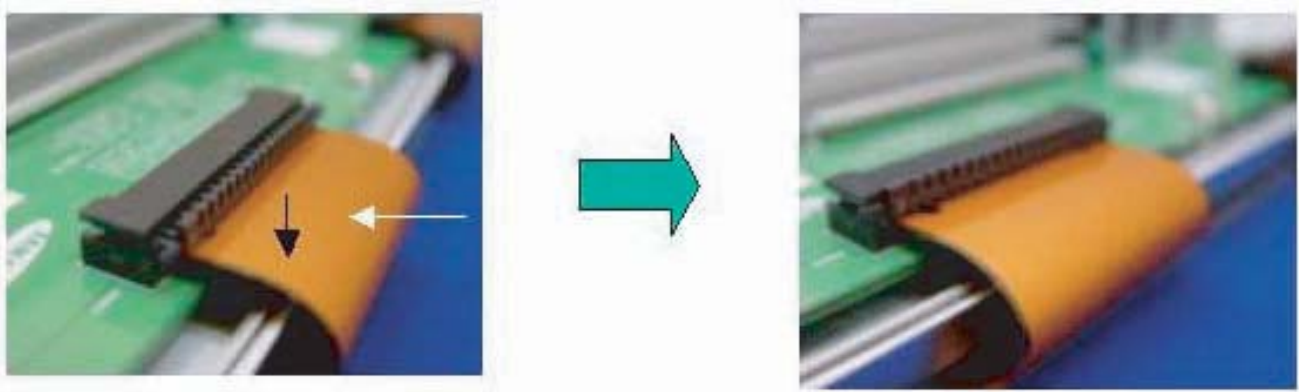


Figure 4-4 Re-assembly FCC of X-main board

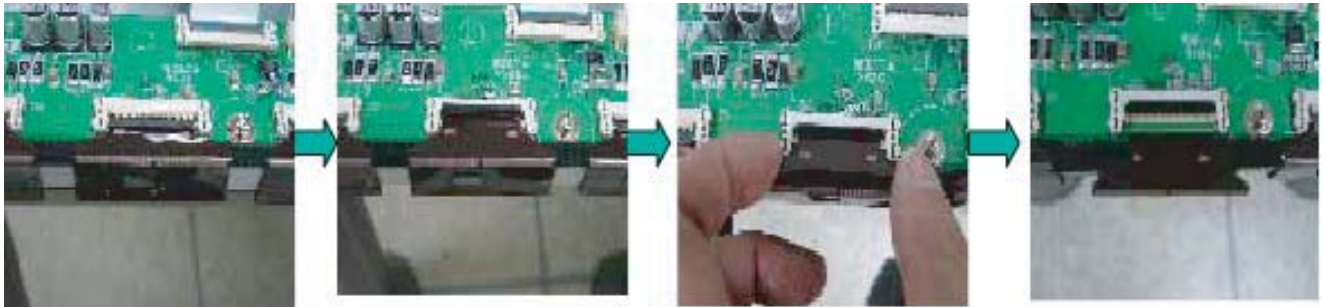
4.1.3 Assembling & Disassembling FFC and TCP Cables from their Connectors

- Dis-assembling of TCP:
 1. Open the clamp carefully.
 2. Pull the TCP out from its connector.
- Re-assembling of TCP:
 1. Put the TCP into the connector carefully

2. Close the clamp completely, until you hear a “Click”.

Notes:

- Carefully check if there is no foreign material on the inside of the connector before inserting the TCP.
- Be careful, do not damage the board by ESD during handling of the TCP.



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Figure 4-5 Dis-assembly of TCP



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Figure 4-6 Re-assembly of TCP



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Figure 4-7 Mis-assembly of TCP



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Figure 4-8 Dis- and re-assembly of FFC

4.1.4 Exchange of LBE and LBF board - 42" HD W2

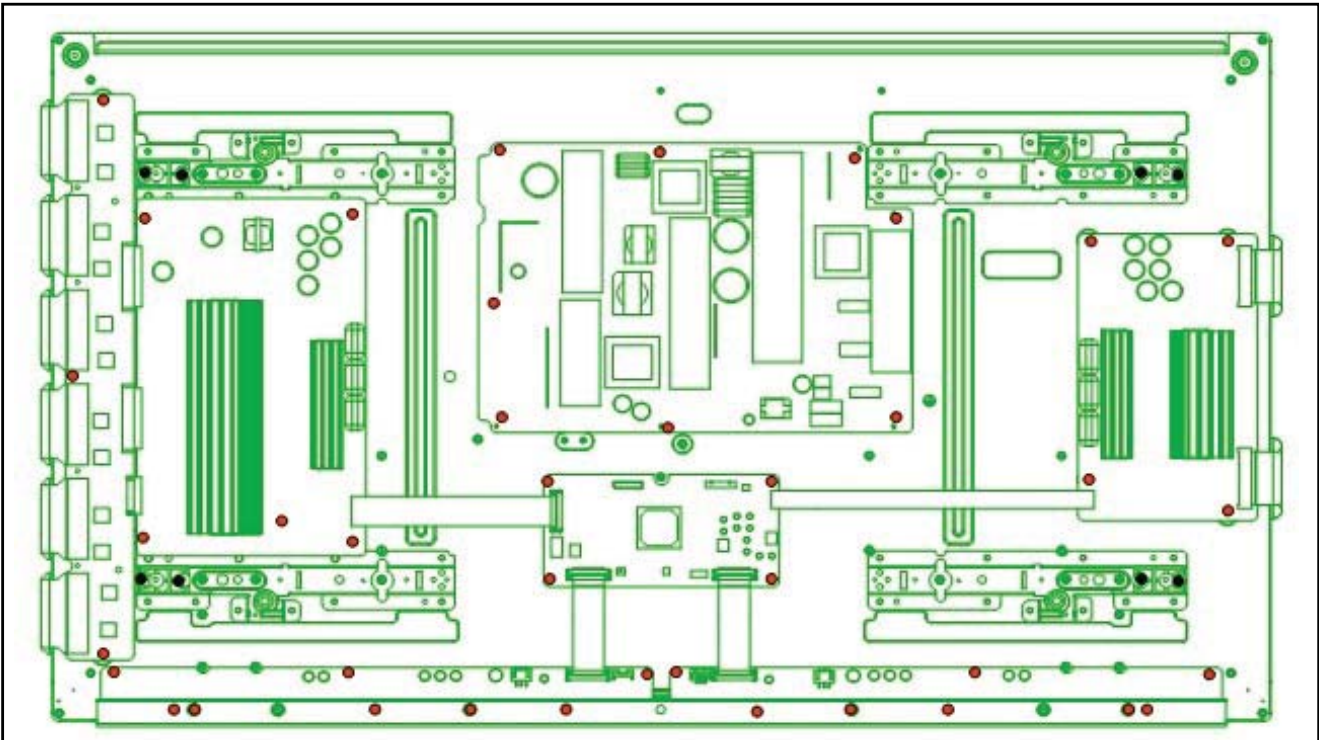
1. Remove the screws in order of 2-3-1-4 from the heatsink and remove the heatsink ("Photos 1 & 3").
2. Remove the TCP, FFC, and power cable from the connectors.
3. Remove all the screws from the defective board.
4. Remove the defective board.
5. Place the new board and then screw tightly.
6. Clean the connectors.
7. Re-connect the TCP, FFC, and power cable to the connectors.
8. Re-assemble the TCP heat sink. Use the screw mounting order 2-3-1-4.

Caution: If you screw too tight, it is possible to damage the Driver IC of the TCP.



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Figure 4-9 Photo 1 - Heatsink 42" HD W2



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Figure 4-10 Photo 2 - Exchange of LBE, LBF board 42" HD W2



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Figure 4-11 Photo 3 - Heat sink removal

4.1.5 Exchange of LBE and LBF board - 42" HD W2 Plus

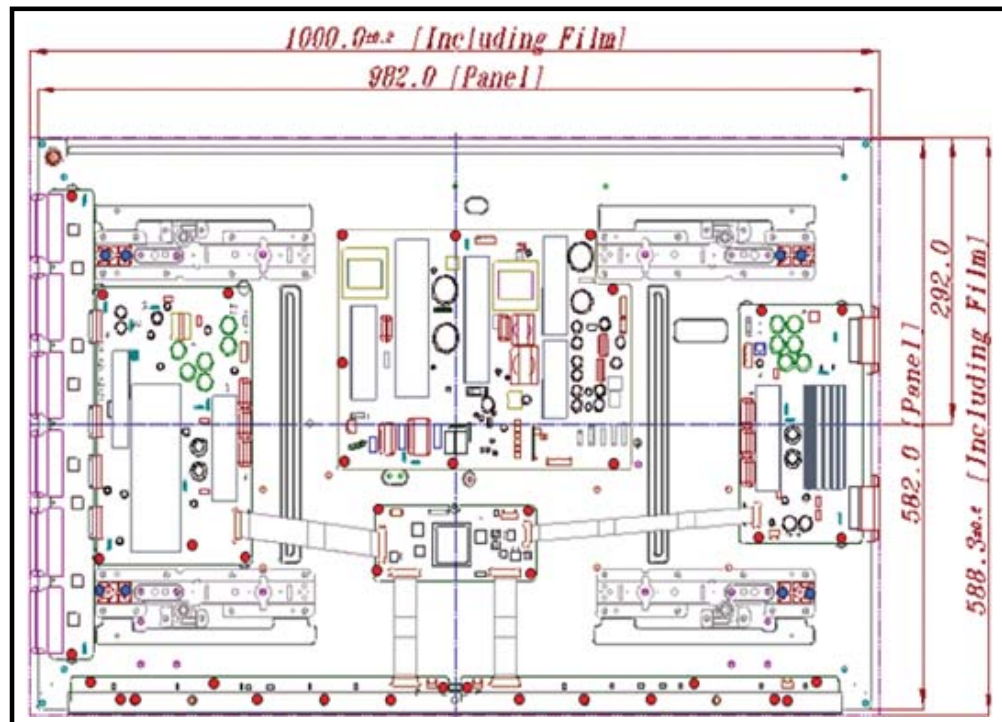
1. Remove the screws in order of 2-3-1-4 from the heatsink and remove the heatsink ("Photos 1 & 3").
2. Remove the TCP, FFC, and power cable from the connectors.
3. Remove all the screws from the defective board.
4. Remove the defective board.
5. Place the new board and then screw tightly.
6. Clean the connectors.
7. Re-connect the TCP, FFC, and power cable to the connectors.
8. Re-assemble the TCP heat sink. Use the screw mounting order 2-3-1-4.

Caution: If you screw too tight, it is possible to damage the Driver IC of the TCP.



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Figure 4-12 Photo 1 - Heatsink 42" HD W2 Plus



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Figure 4-13 Photo 2 - Exchange of LBE, LBF board 42" HD W2 Plus



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Figure 4-14 Photo 3 - Heat sink removal

4.1.6 Exchange of LBE and LBF board - 50" HD W2

1. Remove the screws in order of 2-3-1-4 from the heatsink and remove the heatsink ("Photo 1" and "Photo 3").
2. Remove the TCP, FFC, and power cable from the connectors.
3. Remove all the screws from the defective board.
4. Remove the defective board.
5. Replace the new board and then screw tightly.
6. Clean the connectors.
7. Re-connect the TCP, FFC, and power cable to the connectors.
8. Re-assemble the TCP heat sink. Use the same screw mounting order as described above.

Caution: If you screw too tight, it is possible to damage the Driver IC of the TCP.



Figure 4-15 Photo 1 - Heatsink 50" HD W2

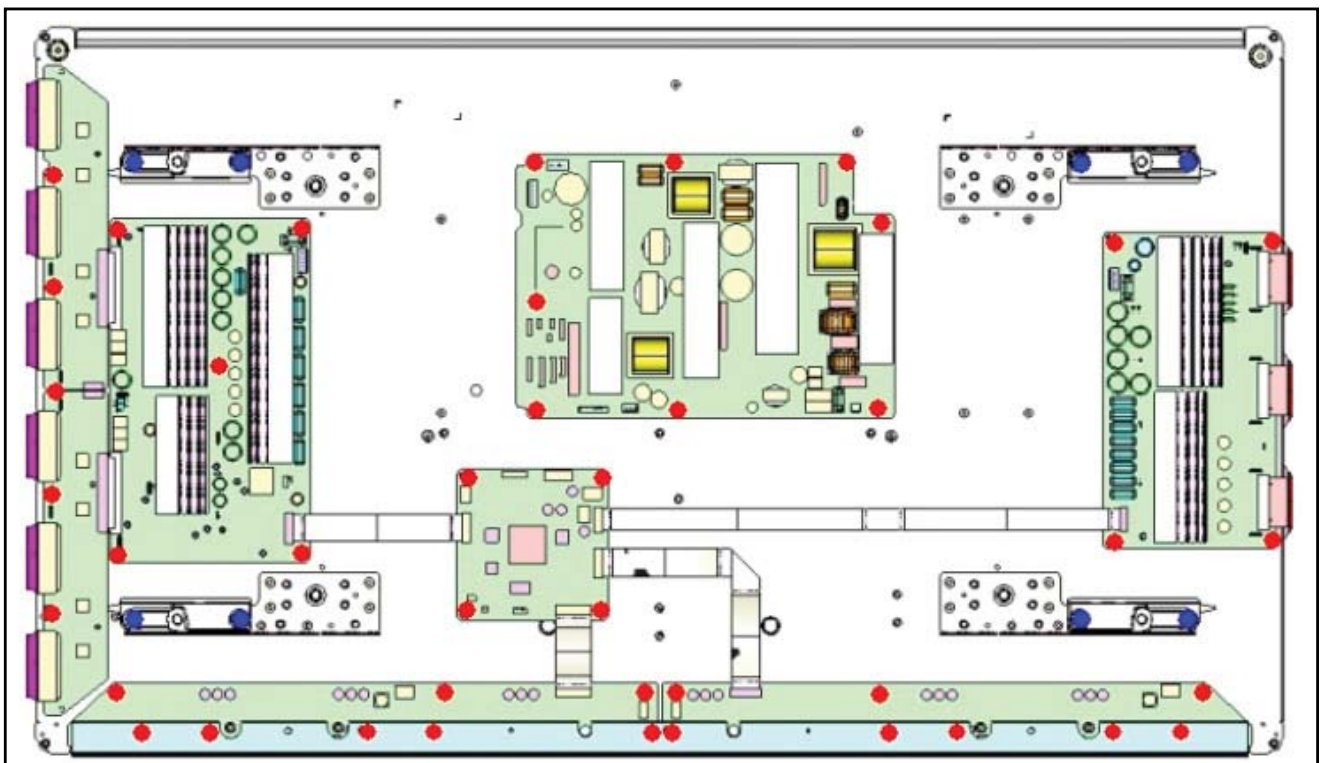


Figure 4-16 Photo 2 - Exchange of LBE and LBF board 50" HD W2



Figure 4-17 Photo 3 - Heat sink removal

4.1.7 Exchange of LBE and LBF board - 50" HD W2 Plus

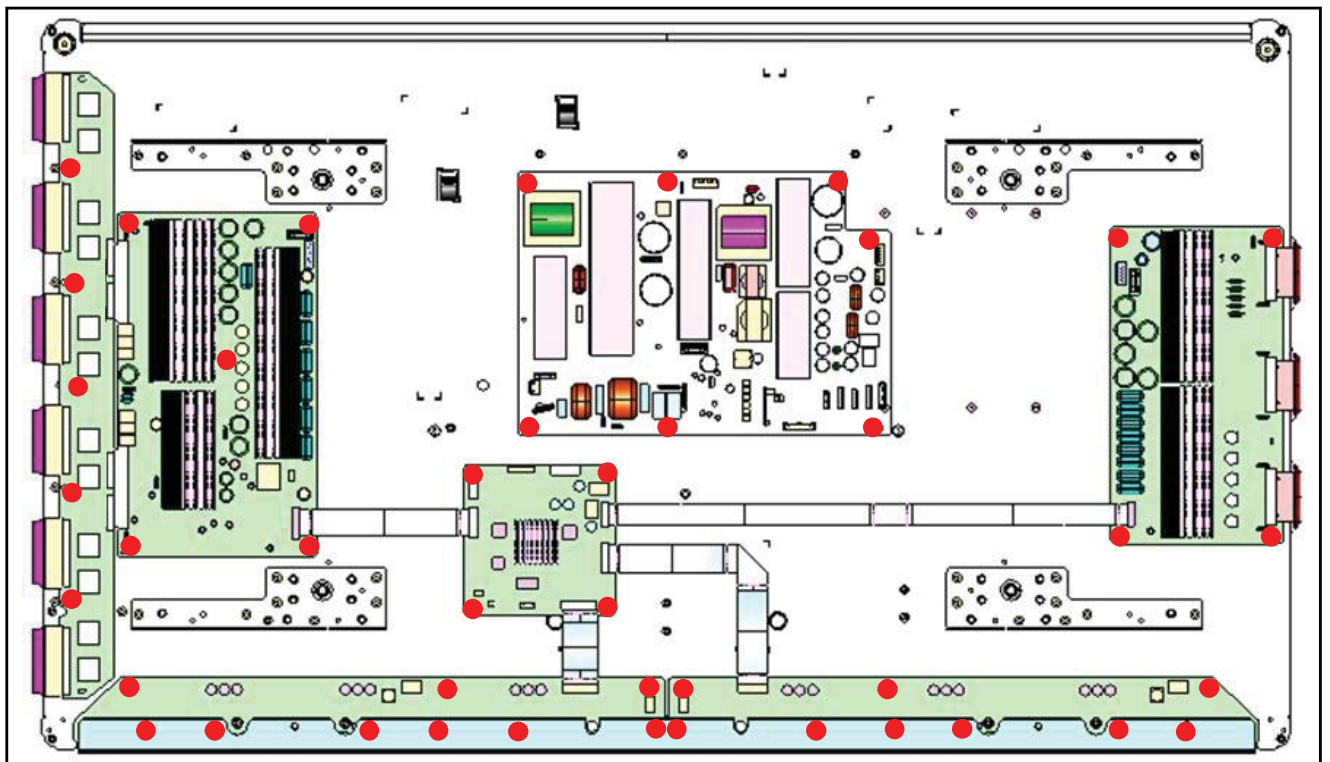
1. Remove the screws in order of 2-3-1-4 from the heatsink and remove the heatsink ("Photos 1 & 3").
2. Remove the TCP, FFC, and power cable from the connectors.
3. Remove all the screws from the defective board.
4. Remove the defective board.
5. Place the new board and then screw tightly.
6. Clean the connectors.
7. Re-connect the TCP, FFC, and power cable to the connectors.
8. Re-assemble the TCP heat sink. Use the screw mounting order 2-3-1-4.

Caution: If you screw too tight, it is possible to damage the Driver IC of the TCP.



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Figure 4-18 Photo 1 - Heatsink 50" HD W2 Plus



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Figure 4-19 Photo 2 - Exchange of LBE, LBF board 50" HD W2 Plus

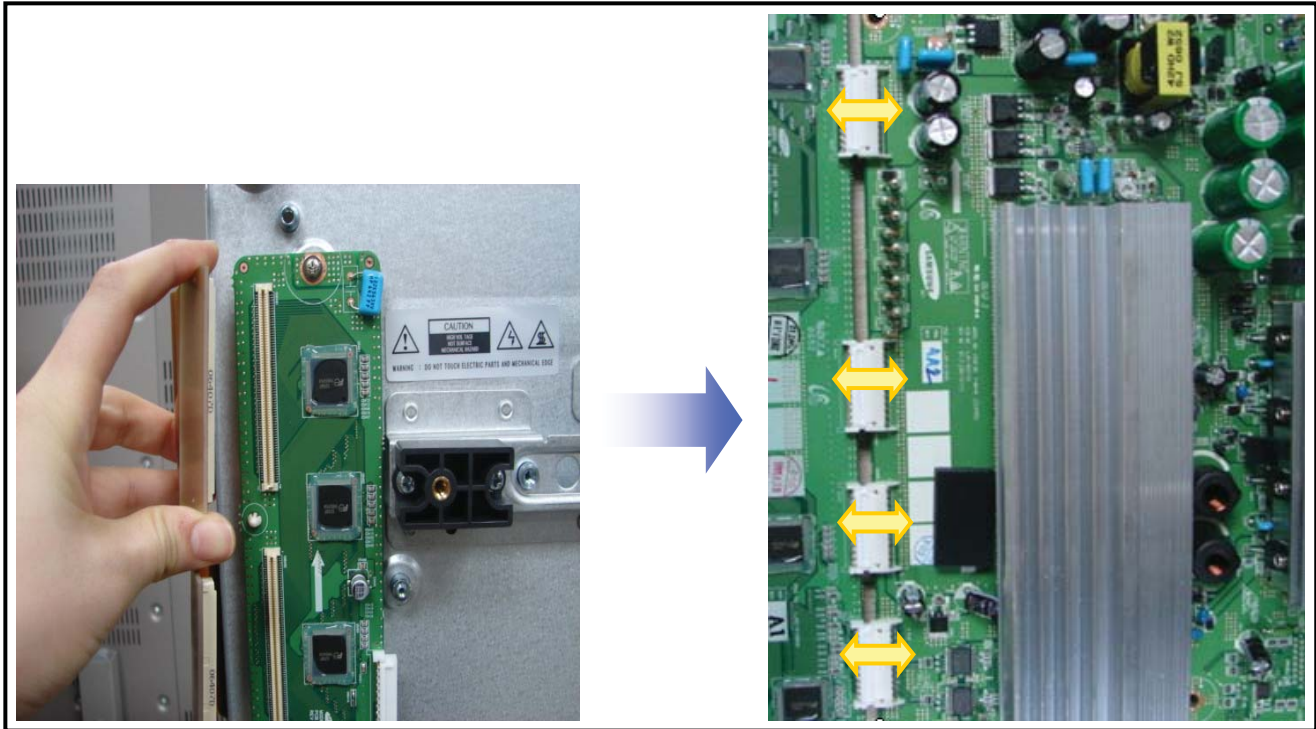


G_16380_022.eps
160606

Figure 4-20 Photo 3 - Heat sink removal

4.1.8 Exchange YB and YM board - 42" HD W2 & 42" HD W2 Plus

1. Unplug all of the FPC connectors of Y-B. See "Photo 1".
2. Loosen all the screws of Y-Buffer and Y-Main.
3. Remove the board from the chassis.
4. Unplug connectors CN5001, CN5002, CN5006 and CN5003 between Y-Buffer and Y-Main. See "Photo 2".
5. Remove Y-Buffer from the Y-main.
6. Replace the defective board.
7. Re-assemble Y-Buffer to the Y-Main.
8. Plug in connectors CN5001, CN5002, CN5006 and CN5003 between Y-Buffer and Y-Main.
9. Arrange the boards on the chassis and tighten them.
10. Connect the FPC connectors.
11. Supply the electric power to the module and then check the waveform of the board.
12. Turn "off" the power after the waveform is adjusted.

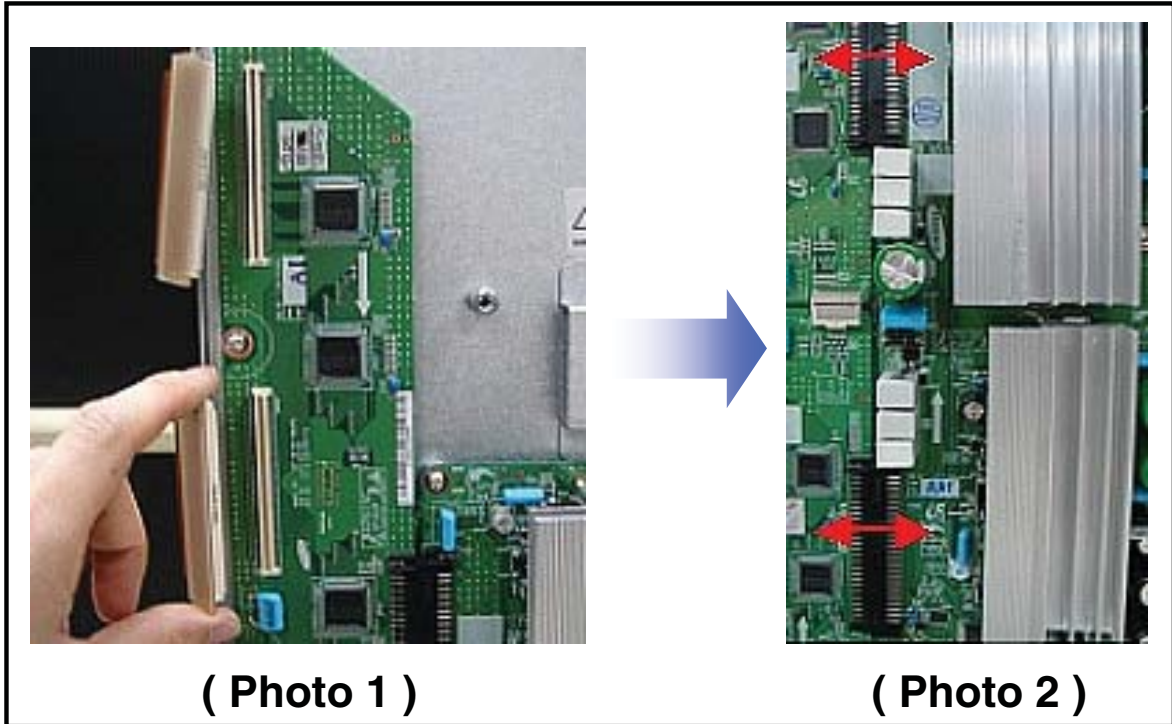


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Figure 4-21 Photo 1 and 2: Dis-assembly of YB and YM board - 42" HD W2 & 42" HD W2 Plus

4.1.9 Exchange YB and YM board - 50" HD W2 & 50" HD W2 Plus

1. Unplug all of the FPC connectors of YB. See "Photo 1".
2. Unplug connectors CN5600 and CN5601 between YB and YM ("Photo 2").
3. Loosen all the screws of YB, and Y-Main.
4. Remove the board from the chassis.
5. Remove the YB from the Y-main.
6. Replace the defective board.
7. Re-assemble the YB to the Y-Main.
8. Plug in connectors CN5600 and CN5601 between YB and YM.
9. Arrange the board on the chassis and then screw to fix.
10. Connect the FPCs.
11. Supply the electric power to the module and then check the waveform of the board.
12. Turn "off" the power after the waveform is adjusted.



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Figure 4-22 Photo 1 and 2: Dis-assembly of YB and YM board - 50" HD W2 & 50" HD W2 Plus

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

- 5.1 Repair Tools
 - 5.1.1 ComPair
 - 5.1.2 Other Service Tools
- 5.2 Fault Finding
 - 5.2.1 Fault finding tree
 - 5.2.2 Faulty Power Supply
 - 5.2.3 No Display
 - 5.2.4 Abnormal display
 - 5.2.5 Horizontal line or block open (some horizontal lines do not exist)
 - 5.2.6 Address open (some vertical lines do not exist)
 - 5.2.7 Address short (some vertical lines appear to be linked on the screen)
 - 5.2.8 Criteria for Panel Replacement, due to Defective Panel Cells
 - 5.2.9 Defect Overview
- 5.3 Defect Description Form

5.1 Repair Tools

5.1.1 ComPair

For the w2 and w2 Plus models, it will be possible to generate test patterns with ComPair. The ComPair interface must be connected to the Logic Board with the special interconnection cable (see table below for the order code).

5.1.2 Other Service Tools

Table 5-1 Overview Service tools

Service Tools	Order Code
ComPair / SDI interconnection cable	3122 785 90800
Foam buffers (2 pcs.)	3122 785 90581

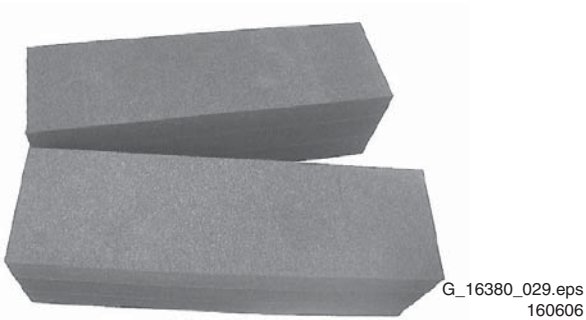


Figure 5-1 Foam buffers

5.2 Fault Finding

5.2.1 Fault finding tree

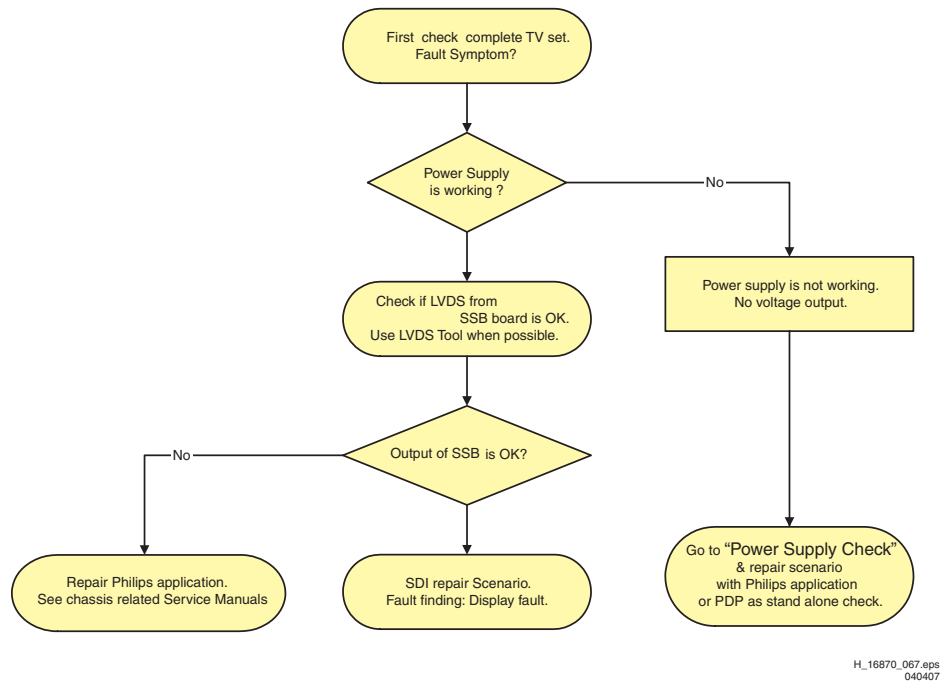


Figure 5-2 Fault symptom overview (complete TV set) [1/2]

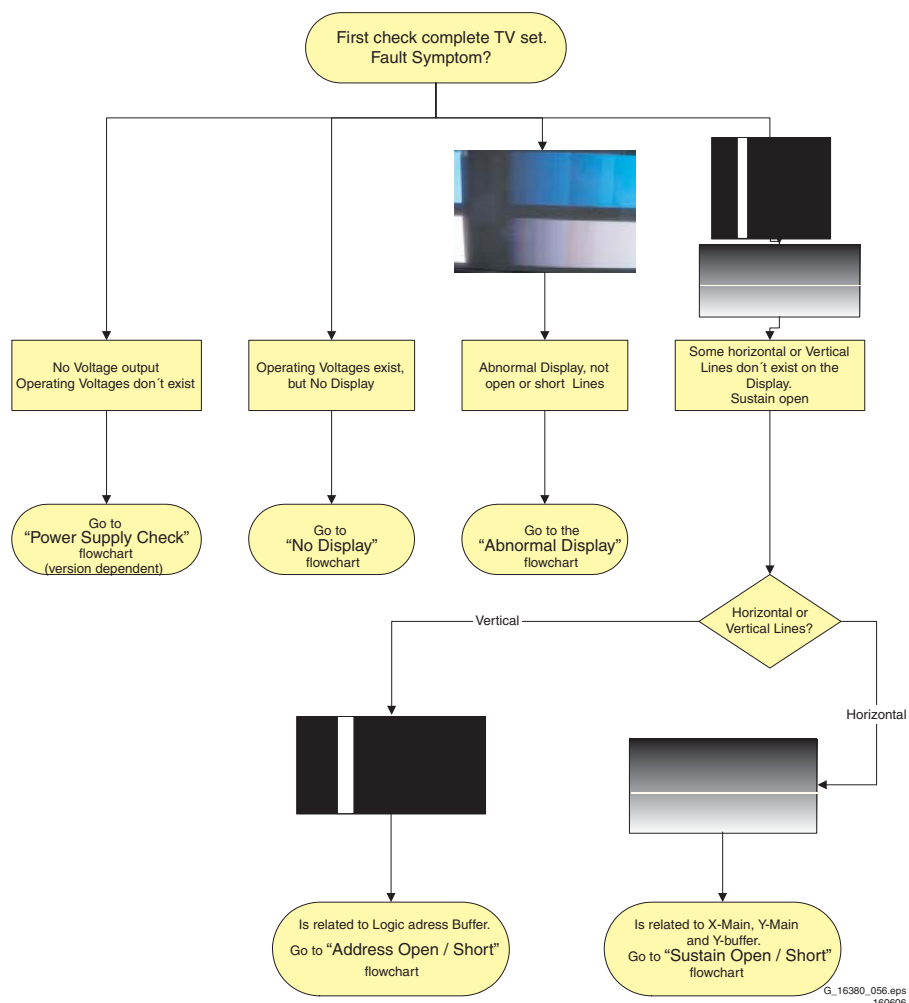


Figure 5-3 Fault symptom overview (complete TV set) [2/2]

5.2.2 Faulty Power Supply

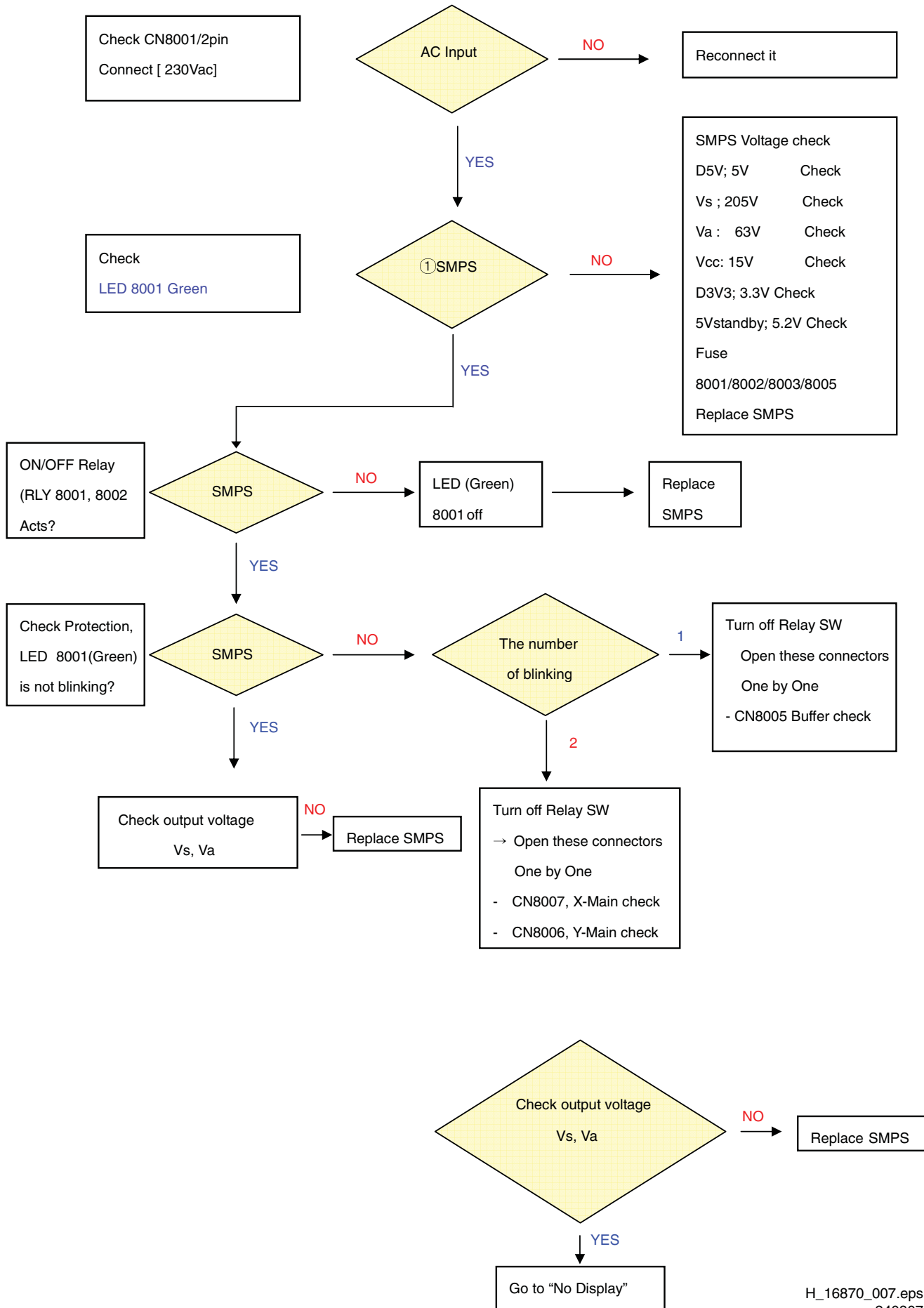


Figure 5-4 Power Supply Check for 42" HD W2 & 42" HD W2 Plus models

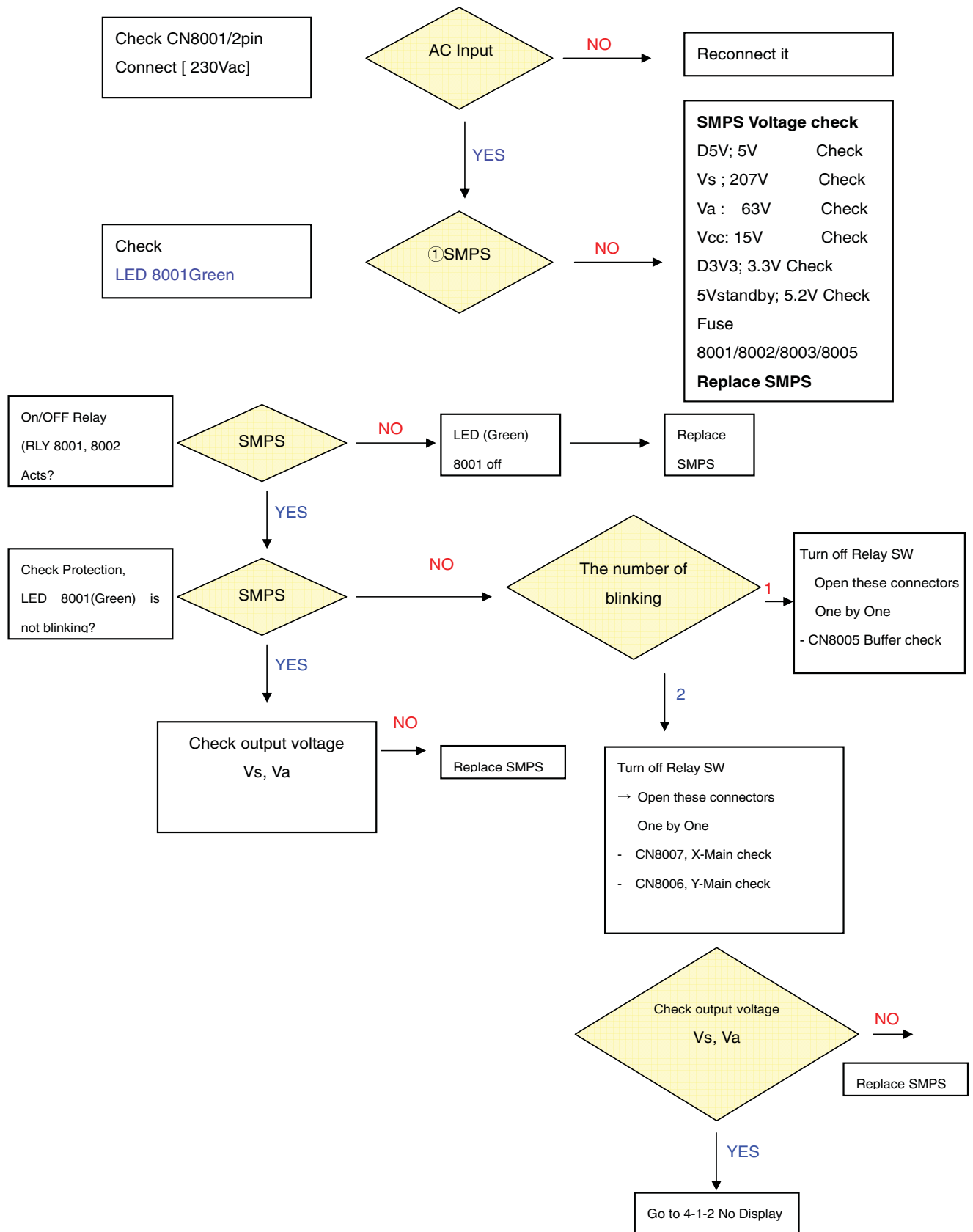


Figure 5-5 Power Supply Check for 50" HD W2 models

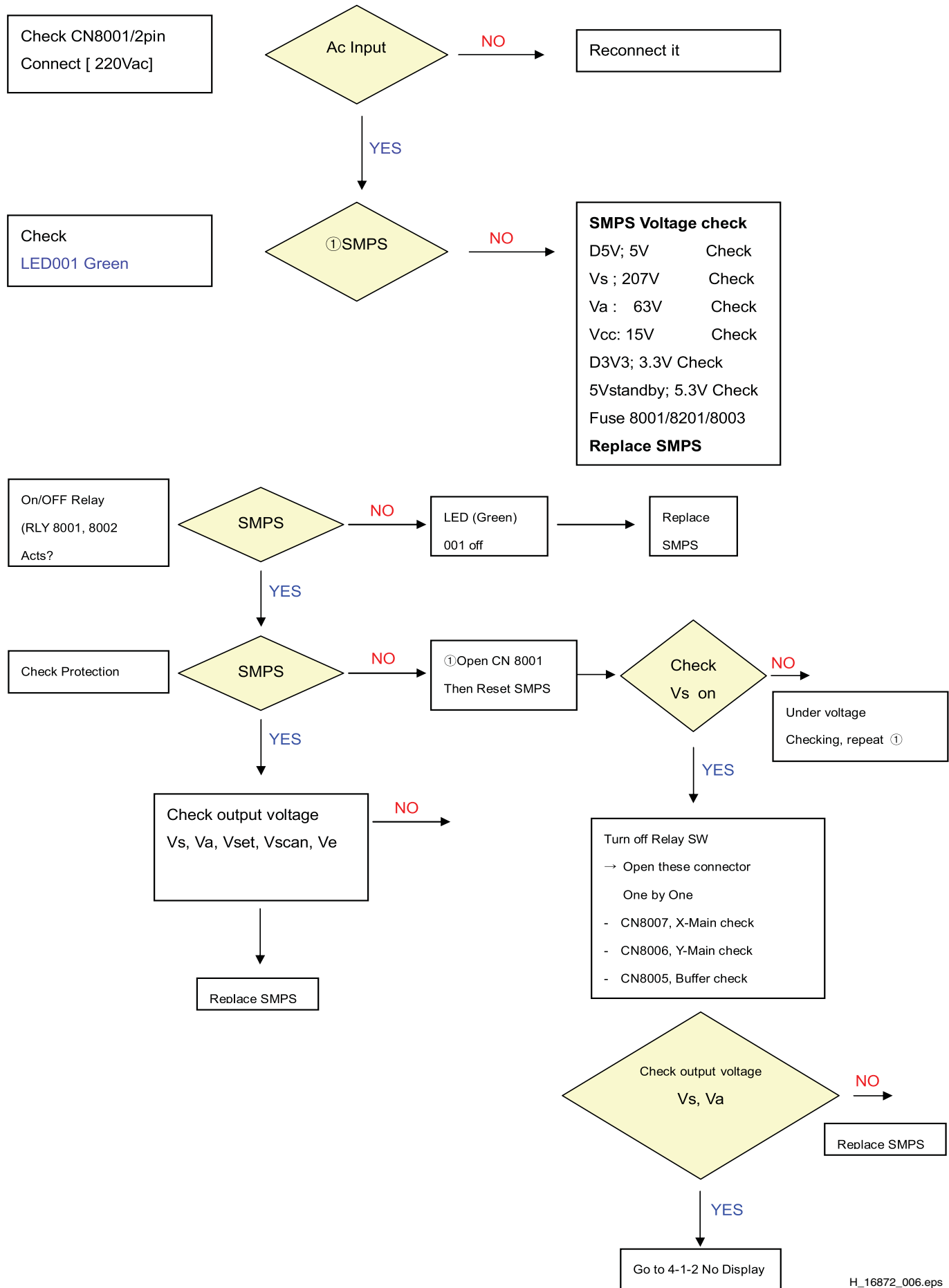


Figure 5-6 Power Supply Check for 50" HD W2 Plus models

5.2.3 No Display

"No Display" is related to Y-Main, X-Main, Logic Main and so on. This page shows you how to check the boards, and the following pages show you how to find the defective board.

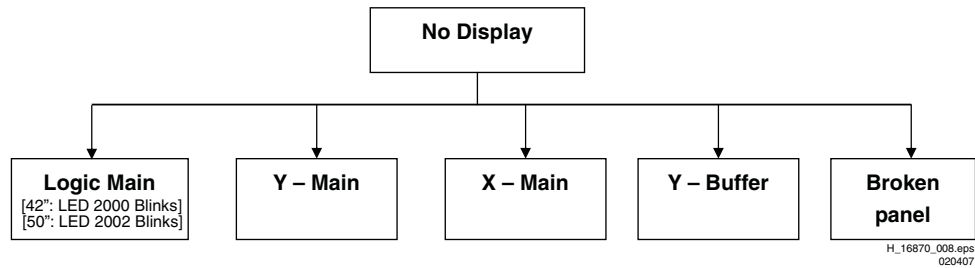


Figure 5-7 Fault symptom: "No Display", general guide line

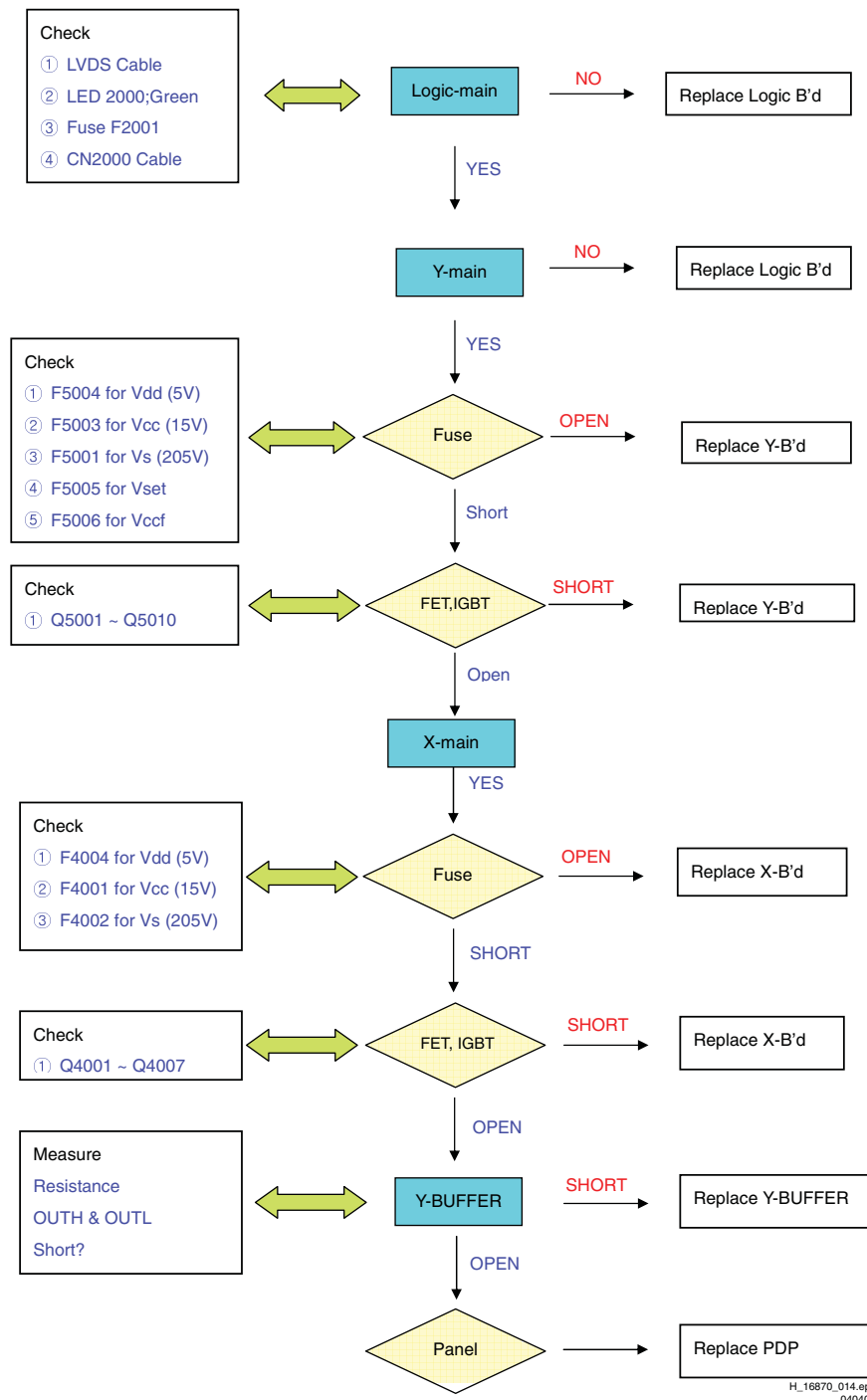





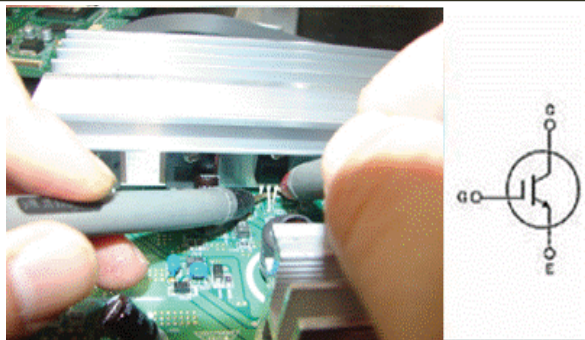


Figure 5-8 Fault finding tree: "No Display", 42" HD W2 [1/5]

Y-main Check Point

	<p>OR</p> 
<p>Vs fuse (F5001) – OK (0.x ~ x.x ohm)</p>	<p>Vs fuse (F5001) – OPEN (x.x Mohm)</p>
	<p>OR</p> 
<p>15V fuse (F5003) – OK (0.x ~ x.x ohm)</p>	<p>15V fuse (F5003) – OPEN (x.x Mohm)</p>
	<p>OR</p> 
<p>5V fuse (F5004) – OK (0.x ~ x.x ohm)</p>	<p>5V fuse (F5004) – OPEN (x.x Mohm)</p>
	<p>OR</p> 
<p>Vset fuse (F5005) – OK (0.x ~ x.x ohm)</p>	<p>Vset fuse (F5005) – OPEN (x.x Mohm)</p>
	<p>OR</p> 
<p>Vccf (F5006) – OK (0.x ~ x.x ohm)</p>	<p>Vccf (F5006) – OPEN (x.x Mohm)</p>

Figure 5-9 Y-Main check points 42" HD W2 [2/5]

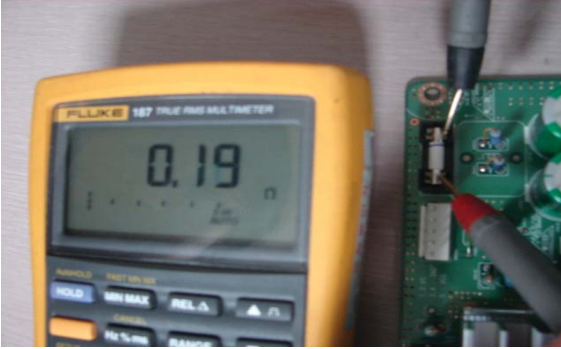

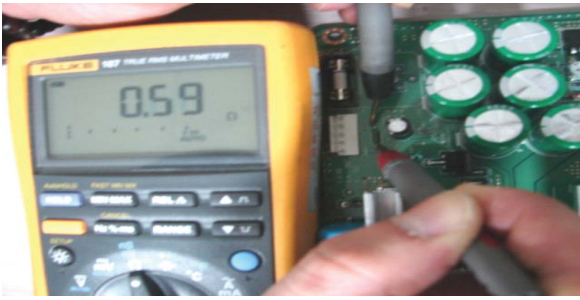

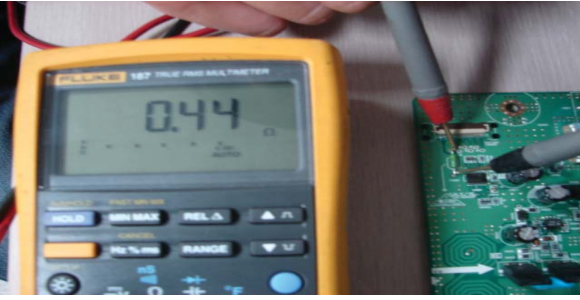
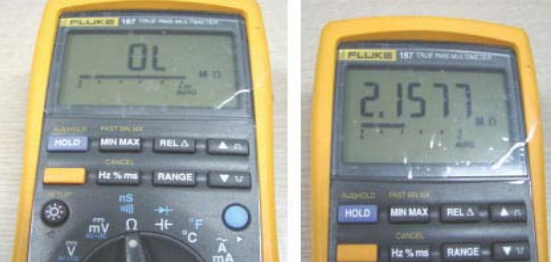
IGBT, FET Check Point

	 OK	 Short
FET,IGBT (contain the inner diode) [Ys, Yg, Yscan, Yfr, Yrr, Xs, Xg, Xb]	OK (0.3 ~ 0.9 V) / Short (0.000 ~ 0.00x V)	
	 OK	 Short
IGBT (do not contain the inner diode) (Yr, Yf, Xr, Xf)	OK (xx.x kohm) / Short (x.x ohm)	
Ys(Q5007), Yg(Q5001), Yscan(Q5008,9), Yfr(Q5006), Yrr(Q5004), Xs(Q4001), Xg(Q4002), Xb(Q4003,4) Yr(Q5003), Yf(Q5002), Xr(Q4006), Xf(Q4005)		

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Figure 5-10 FET, IGBT check points 42" HD W2 [3/5]

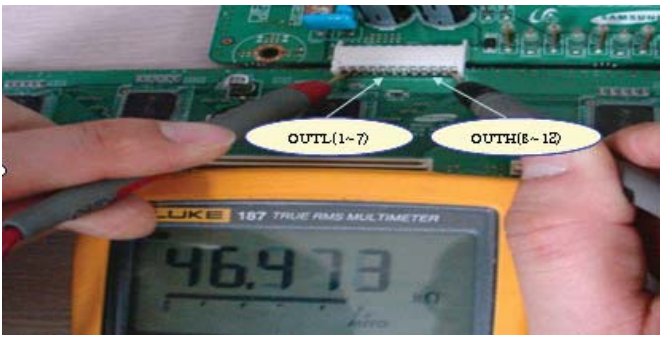
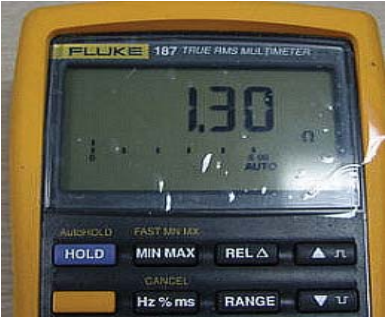
X-Main Check Point

	<p>OR</p> 
Vs fuse (F4002) – OK (0.x ~ x.x ohm)	Vs fuse (F4002) – OPEN (x.x Mohm)
	<p>OR</p> 
15V fuse (F4001) – OK (0.x ~ x.x ohm)	15V fuse (F4001) – OPEN (x.x Mohm)
	<p>OR</p> 
5V fuse (F4004) – OK (0.x ~ x.x ohm)	5V fuse (F4004) – OPEN (x.x Mohm)

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Figure 5-11 X-Main check points 42" HD W2 [4/5]

Y-Buffer Check Point

	
OUTL↔OUTH – OK (x.x Mohm)	OUTL↔OUTH – Short (x.x ohm)

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Figure 5-12 Y-Buffer check points 42" HD W2 [5/5]

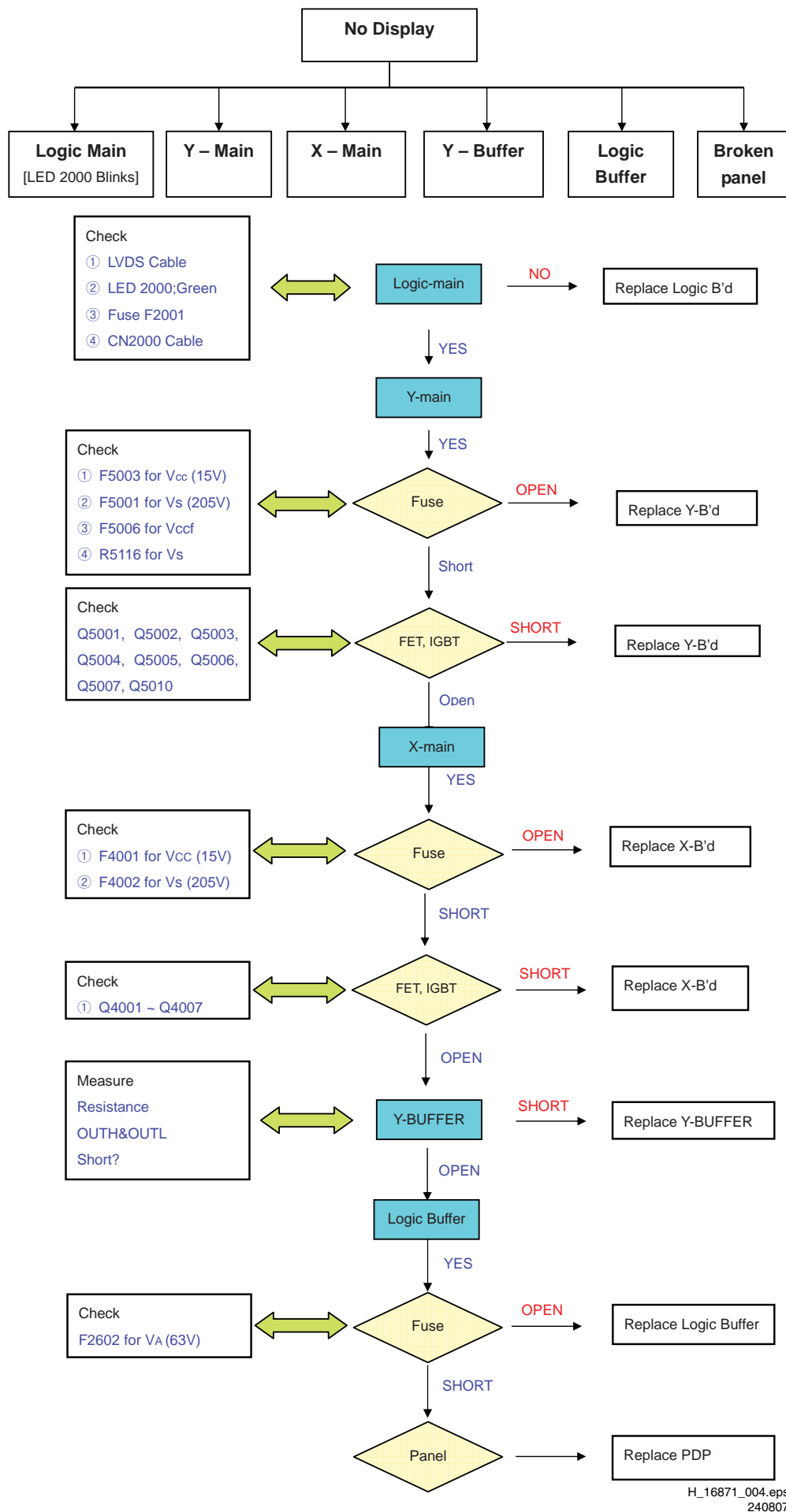












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Figure 5-13 Fault finding tree: "No Display", 42" HD W2 Plus [1/5]



Y-main Check Point

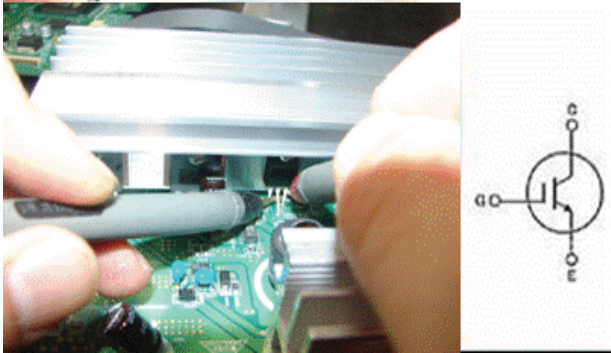

	OR  
Vs fuse (F5001) – OK (0.x ~ x.x ohm)	Vs fuse (F5001) – OPEN (x.x Mohm)
	OR  
15V fuse (F5003) – OK (0.x ~ x.x ohm)	15V fuse (F5003) – OPEN (x.x Mohm)
	OR  
Vccf fuse (F5006) – OK (0.x ~ x.x ohm)	Vcc fuse (F5006) – OPEN (x.x Mohm)
	OR  
R-fusible (R5116) – OK (1.xohm)	R-fusible (R5116) – OPEN (x.x Mohm)

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Figure 5-14 Y-Main check points 42" HD W2 Plus [2/5]

IGBT, FET Check Point







	 <div data-bbox="1023 629 1062 656">OK</div> <div data-bbox="1337 629 1406 656">Short</div>
<p>FET,IGBT (contain the inner diode) [Ys, Yg, Yfr, Yrr, Xs, Xg, Xb]</p>	<p>OK (0.3 ~ 0.9 V) / Short (0.000 ~ 0.00x V)</p>

	 <div data-bbox="1026 1187 1066 1214">OK</div> <div data-bbox="1347 1187 1415 1214">Short</div>
<p>IGBT (do not contain the inner diode) (Yr, Yf, Xr, Xf)</p>	<p>OK (xx.x kohm) / Short (x.x ohm)</p>

Ys(Q5007), Yg(Q5001), Yfr(Q5006), Yrr(Q5004),
Xs(Q4001), Xg(Q4002), Xb(Q4003,4)
Yr(Q5003), Yf(Q5002), Xr(Q4006), Xf(Q4005)

Figure 5-15 FET, IGBT check points 42” HD W2 Plus [3/5]

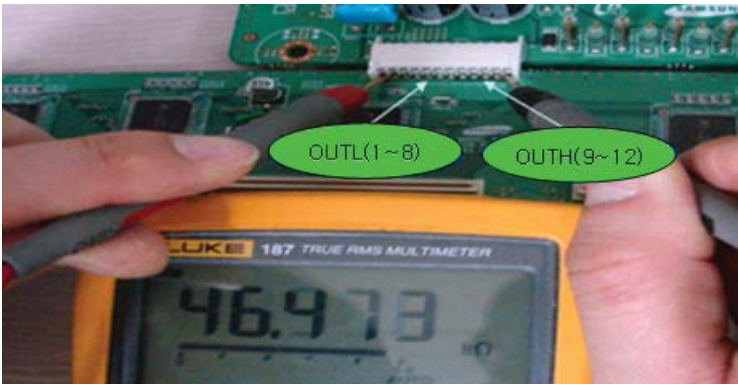

X-main Check Point

	OR	
		
Vs fuse (F4002) – OK (0.x ~ x.x ohm)	Vs fuse (F4002) – OPEN (x.x Mohm)	
	OR	
		
15V fuse (F4001) – OK (0.x ~ x.x ohm)	15V fuse (F4001) – OPEN (x.x Mohm)	

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Figure 5-16 X-Main check points 42" HD W2 Plus [4/5]

Y-buffer Check Point

	
OUTL↔OUTH – OK (x.x Mohm)	OUTL↔OUTH –Short (x.x ohm)

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Figure 5-17 Y-Buffer check points 42" HD W2 Plus [5/5]

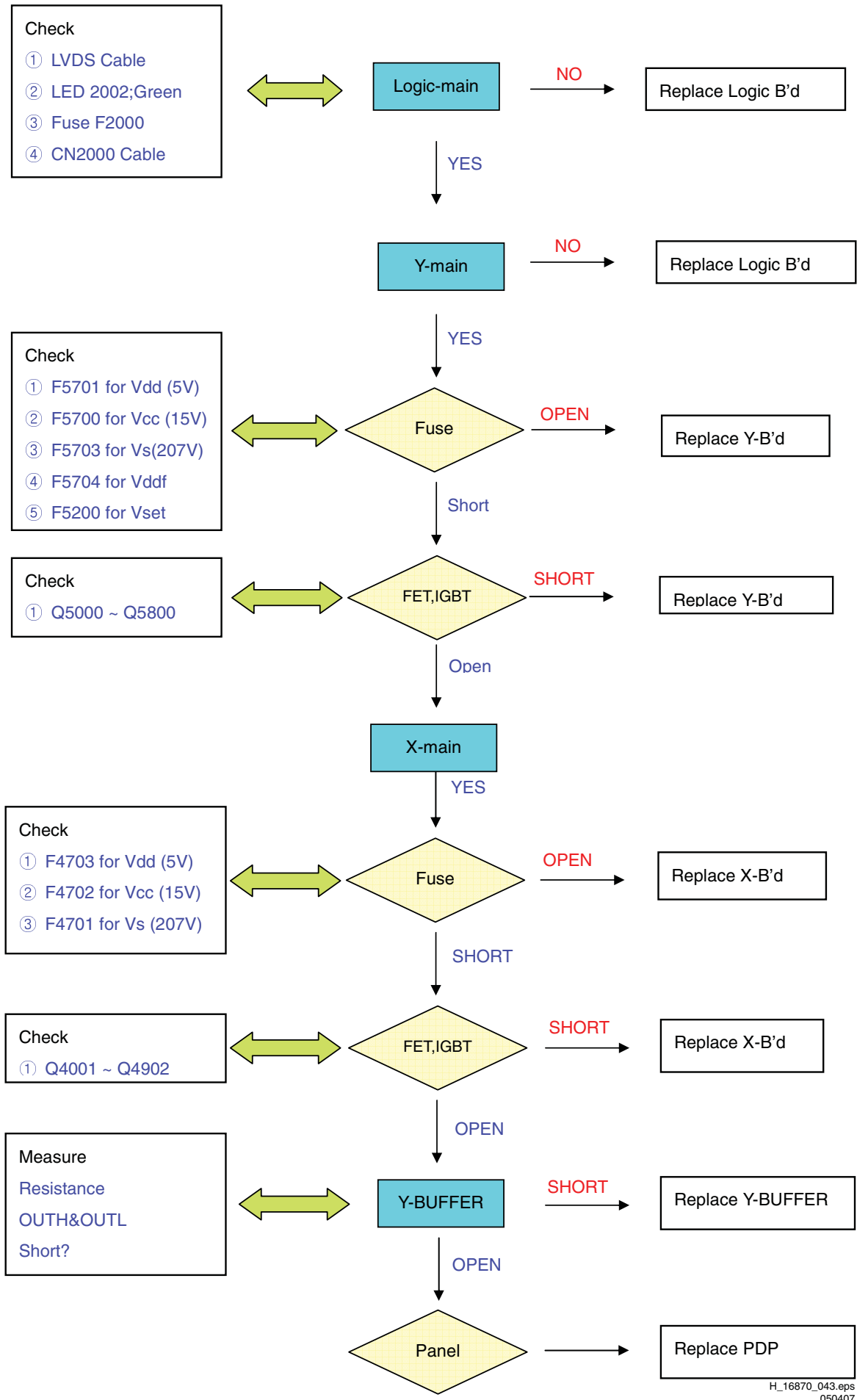


Figure 5-18 Fault finding tree: "No Display", 50" HD W2 [1/5]

Y-main Check Point




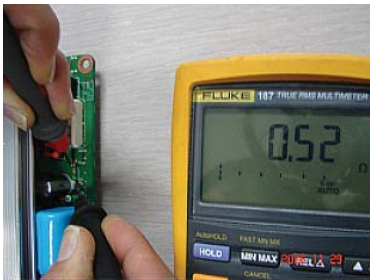


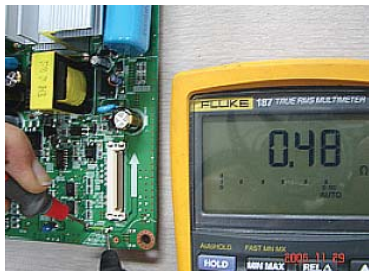


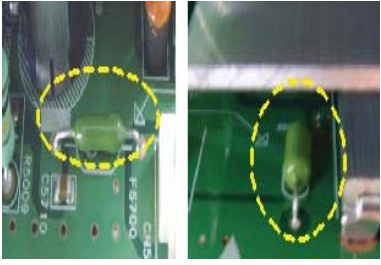









	<p>OR</p>  
<p>Vs fuse (F5703) – OK (0.x ~ x.x ohm)</p>	<p>Vs fuse (F5703) – OPEN (x.x Mohm)</p>
	<p>OR</p>  
<p>15V fuse (F5700) – OK (0.x ~ x.x ohm)</p>	<p>15V fuse (F5004) – OPEN (x.x Mohm)</p>
	<p>OR</p>  
<p>5V fuse (F5701) – OK (0.x ~ x.x ohm)</p>	<p>5V fuse (F5001) – OPEN (x.x Mohm)</p>
	<p>OR</p>  
<p>Vset fuse (F5200) – OK (0.x ~ x.x ohm)</p>	<p>Vset fuse (F5200) – OPEN (x.x Mohm)</p>
	<p>OR</p>  
<p>Vddf (F5704) – OK (0.x ~ x.x ohm)</p>	<p>Vddf (F5704) – OPEN (x.x Mohm)</p>


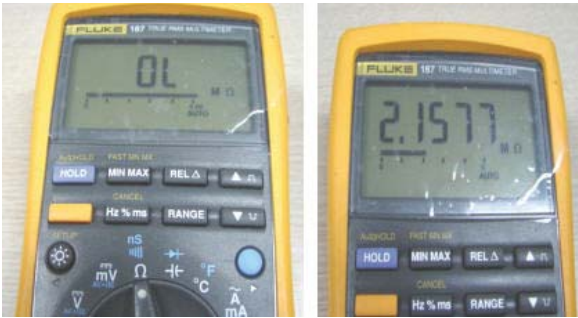






Figure 5-19 Y-Main check points 50" HD W2 [2/5]

IGBT, FET Check Point

	 <p style="text-align: center;">OK Short</p>
<p style="text-align: center;">FET,IGBT (contain the inner diode) [Ys, Yg, Ypn, Yscan, Yfr, Yrr, Xs, Xg, Xb]</p>	<p style="text-align: center;">OK (0.3 ~ 0.9 V) / Short (0.000 ~ 0.00x V)</p>
	 <p style="text-align: center;">OK Short</p>
<p style="text-align: center;">IGBT (do not contain the inner diode) (Yr, Yf, Xr, Xf)</p>	<p style="text-align: center;">OK (xx.x kohm) / Short (x.x ohm)</p>
<p>Ys(Q5100,01), Yg(Q5102,03), Ypn(Q5302,03,04,06), Yscan(Q5400,01), Yfr(Q5500), Yrr(Q5200), Xs(Q4101,02), Xg(Q4103,04), Xb(Q4901,02) Yr(Q5000,02), Yf(Q5001,03), Xr(Q4001), Xf(Q4002,03)</p>	

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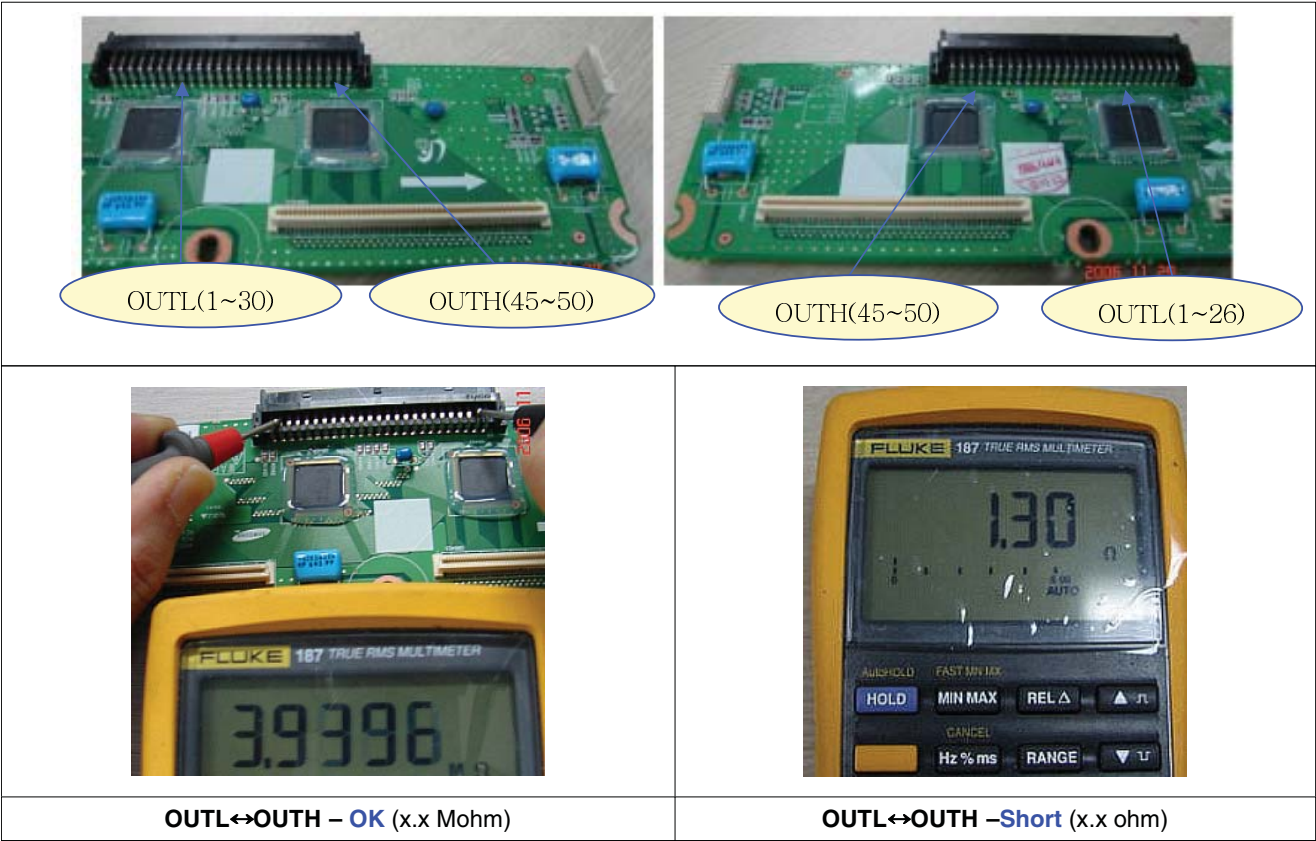
Figure 5-20 FET, IGBT check points 50" HD W2 [3/5]

	<p>OR</p> 
<p>Vs fuse (F4701) – OK (0.x ~ x.x ohm)</p>	<p>Vs fuse (F4701) – OPEN (x.x Mohm)</p>
	<p>OR</p> 
<p>15V fuse (F4702) – OK (0.x ~ x.x ohm)</p>	<p>15V fuse (F4702) – OPEN (x.x Mohm)</p>
	<p>OR</p> 
<p>5V fuse (F4703) – OK (0.x ~ x.x ohm)</p>	<p>5V fuse (F4703) – OPEN (x.x Mohm)</p>
	
<p>5V fuse (F4800) – OK (0.x ~ x.x ohm)</p>	<p>5V fuse (F4800) – OPEN (x.x Mohm)</p>

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Figure 5-21 X-Main check points 50" HD W2 [4/5]

Y-buffer Check Point



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Figure 5-22 Y-Buffer check points 50” HD W2 [5/5]

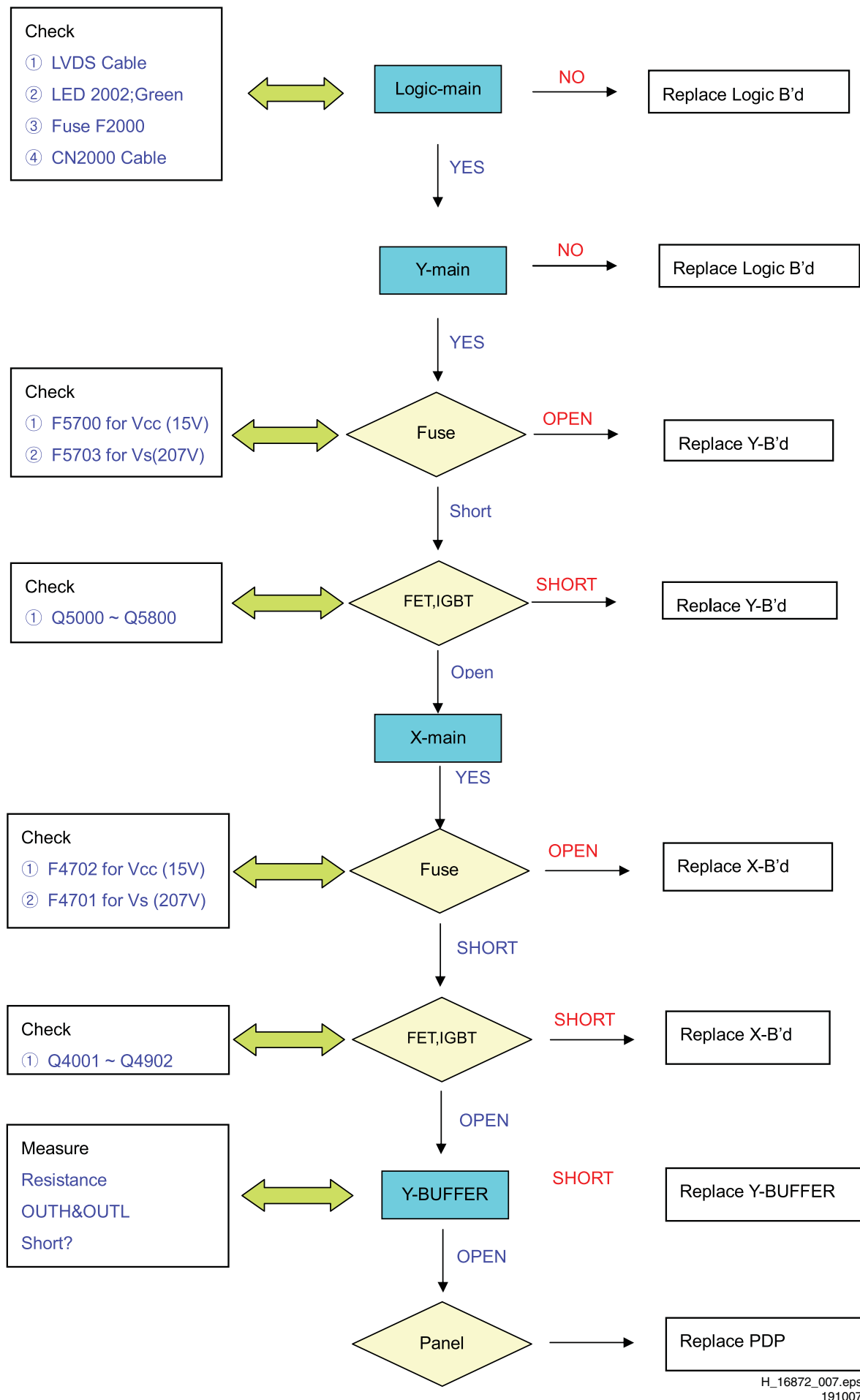


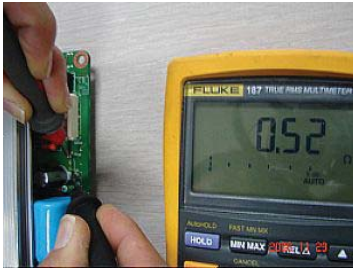







Figure 5-23 Fault finding tree: "No Display", 50" HD W2 Plus [1/5]

Samsung SDI Co. Ltd.	Y-main Check Point	Plasma Display Module
	Vs fuse (F5703) – OK (0.x ~ x.x ohm)	OR 
	15V fuse (F5700) – OK (0.x ~ x.x ohm)	OR 
		15V fuse (F5004) – OPEN (x.x Mohm)




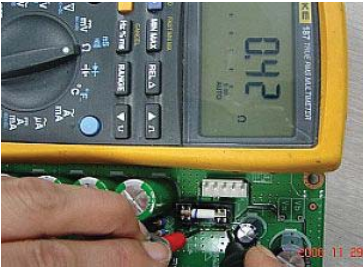


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Figure 5-24 Y-Main check points 50" HD W2 Plus [2/5]

IGBT, FET Check Point	
	 OK Short
FET, IGBT (contain the inner diode) [Ys, Yg, Ypn, Yscan, Yfr, Yrr, Xs, Xg, Xb]	OK (0.3 ~ 0.9 V) / Short (0.000 ~ 0.00x V)
	 OK Short
IGBT (do not contain the inner diode) (Yr, Yf, Xr, Xf)	OK (xx.x kohm) / Short (x.x ohm)
Ys(Q5100,01), Yg(Q5102,03), Ypn(Q5302,03,04,06), Yscan(Q5400,01), Yfr(Q5500), Yrr(Q5200), Xs(Q4101,02), Xg(Q4103,04), Xb(Q4901,02) Yr(Q5000,02), Yf(Q5001,03), Xr(Q4001), Xf(Q4002,03)	

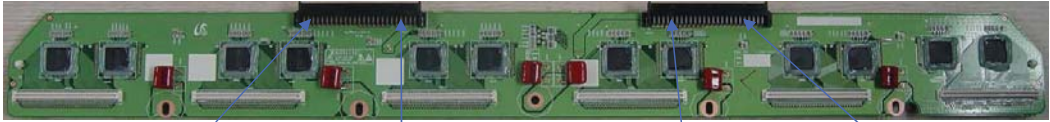
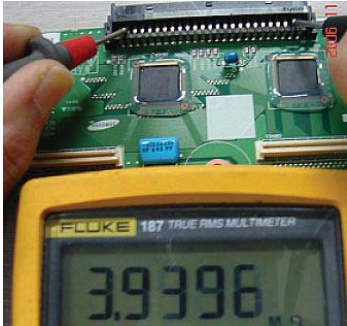

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Figure 5-25 FET, IGBT check points 50" HD W2 Plus [3/5]

	OR  
Vs fuse (F4701) – OK (0.x ~ x.x ohm)	Vs fuse (F4701) – OPEN (x.x Mohm)
	OR  
15V fuse (F4702) – OK (0.x ~ x.x ohm)	15V fuse (F4702) – OPEN (x.x Mohm)

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Figure 5-26 X-Main check points 50” HD W2 Plus [4/5]

<div>Y-buffer Check Point</div> 	
	
OUTL↔OUTH – OK (x.x Mohm)	OUTL↔OUTH –Short (x.x ohm)

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Figure 5-27 Y-Buffer check points 50” HD W2 Plus [5/5]

5.2.4 Abnormal display

“Abnormal Display” is related to Y-Main, X-Main, Logic Main and so on. This page shows you how to check the boards, and the following pages show you how to find the defective board.

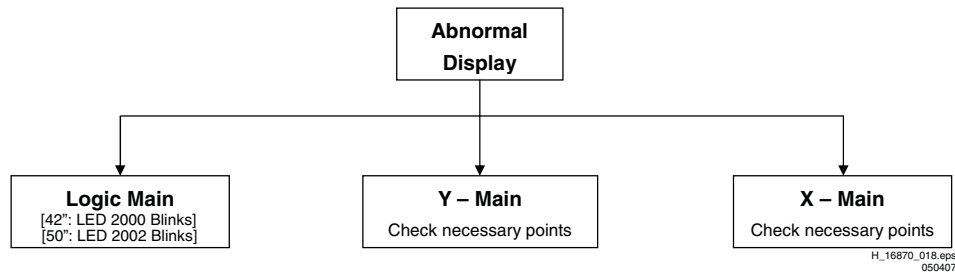


Figure 5-28 Fault symptom: “Abnormal Display”, general guide line

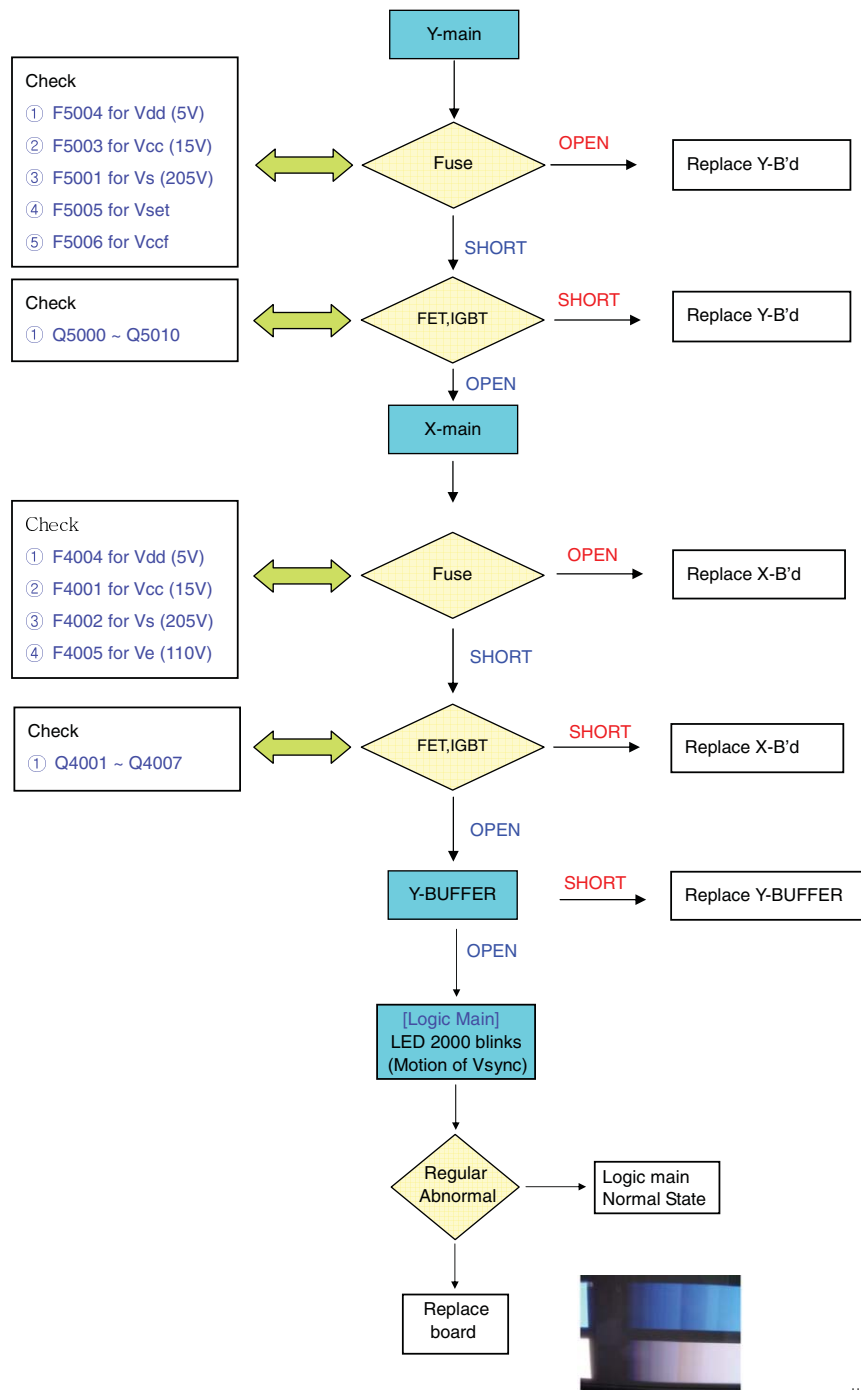


Figure 5-29 Fault symptom: “Abnormal Display” 42” HD W2

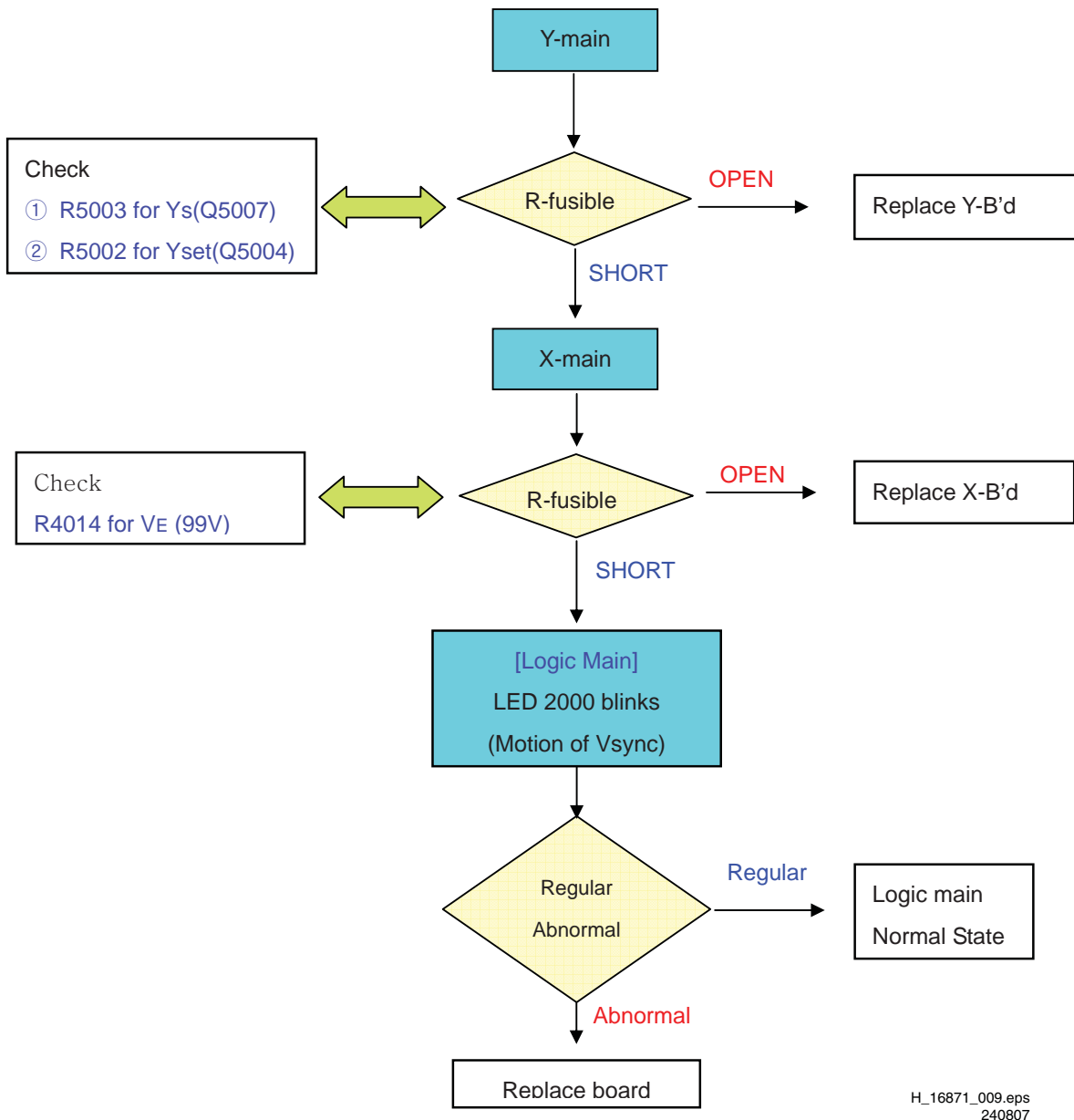
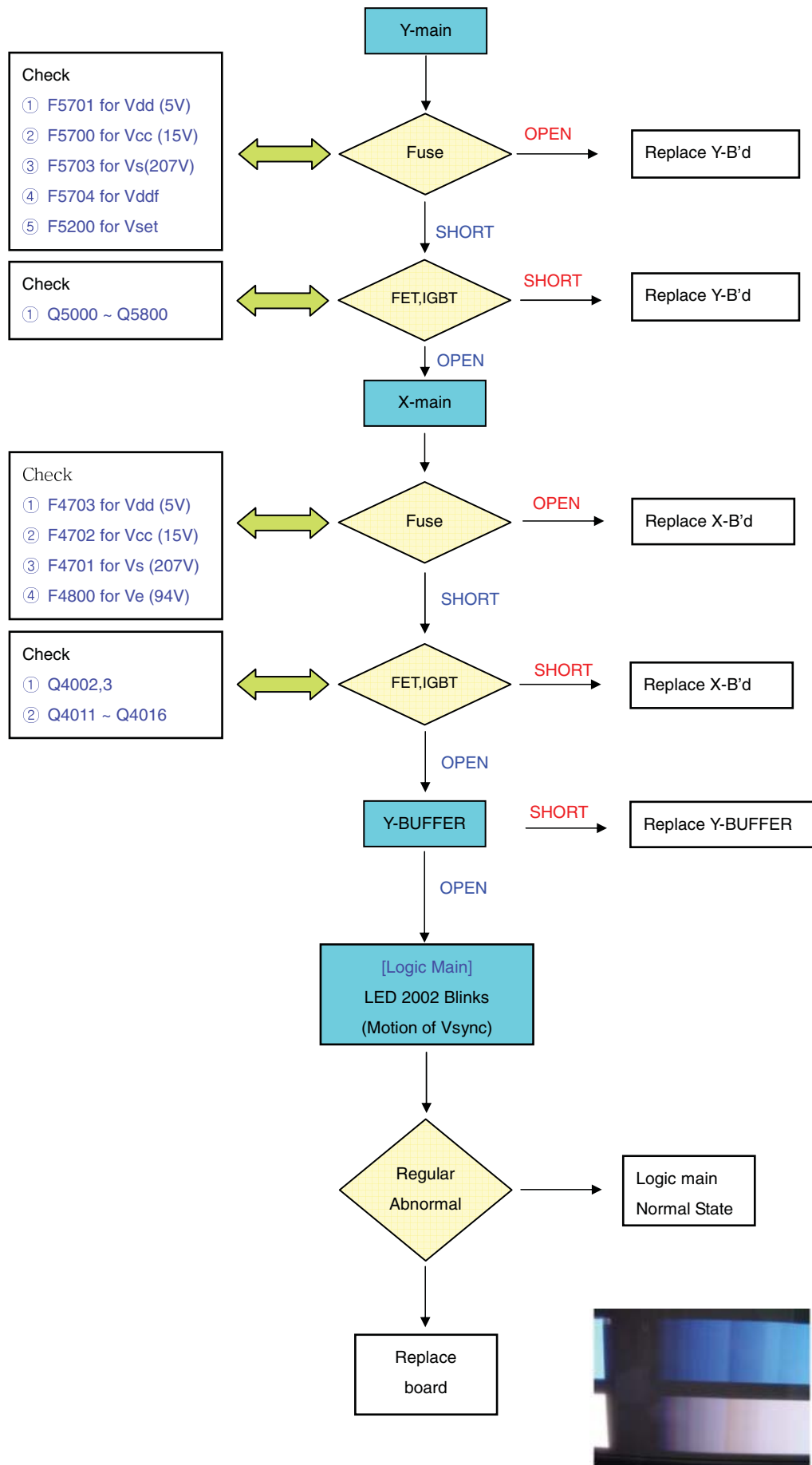


Figure 5-30 Fault symptom: "Abnormal Display" 42" HD W2 Plus



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Figure 5-31 Fault symptom: "Abnormal Display" 50" HD W2

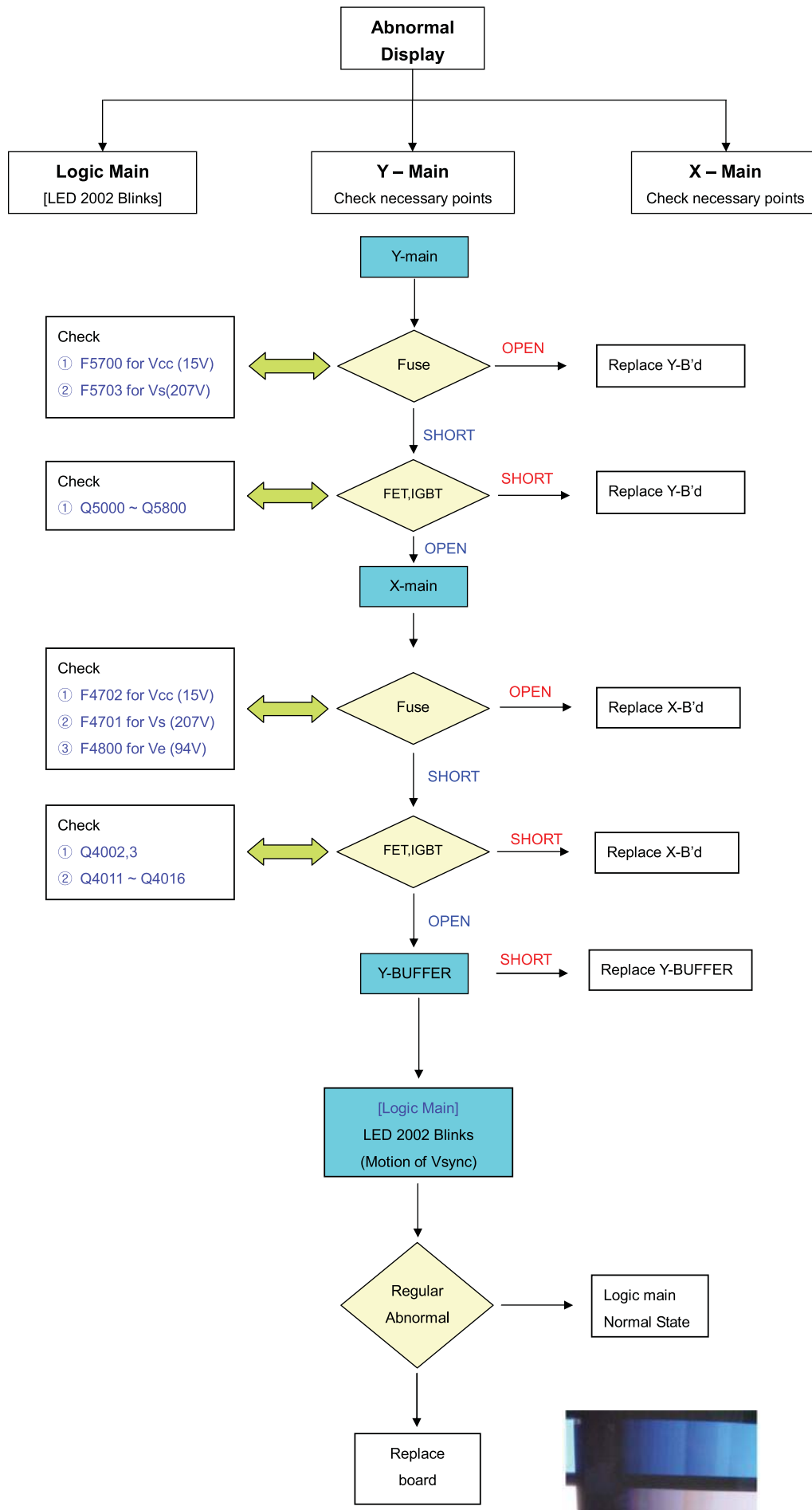


Figure 5-32 Fault symptom: "Abnormal Display" 50" HD W2 Plus

5.2.5 Horizontal line or block open (some horizontal lines do not exist)

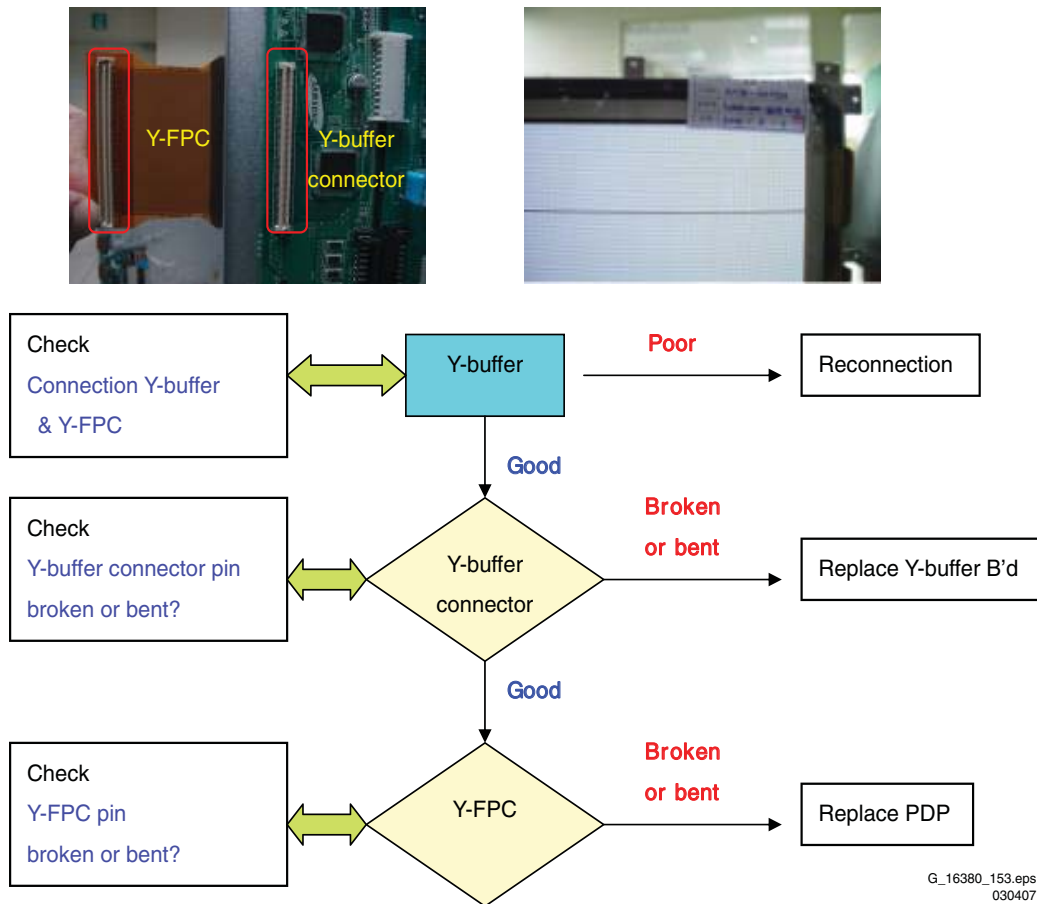


Figure 5-33 Fault symptom: "Horizontal line or block open"

5.2.6 Address open (some vertical lines do not exist)

"Address open" is related to Logic Main, Logic Buffer, FFC, TCP and so on. This page shows you how to check the boards, and the following pages show you how to find the defective board.

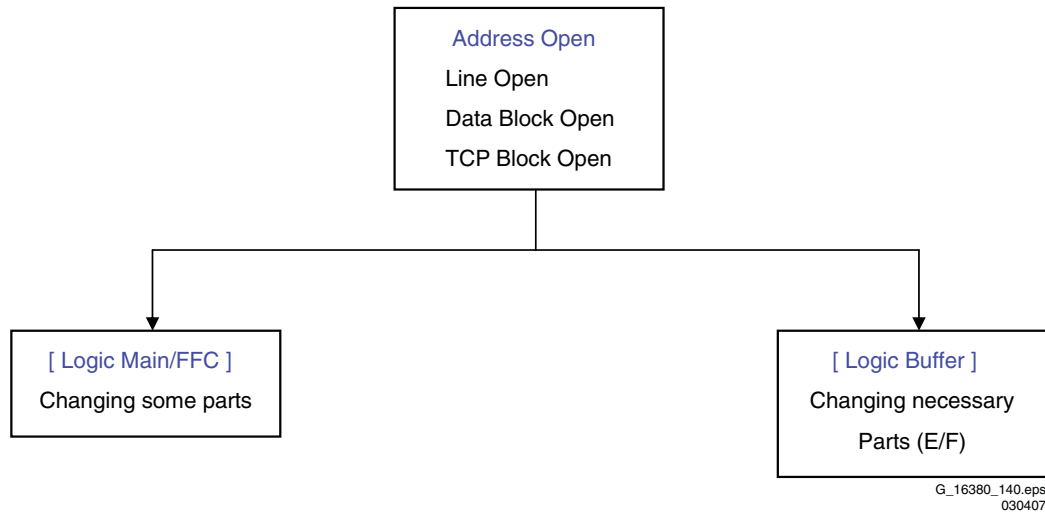


Figure 5-34 Fault symptom: "Address open" [1/2]

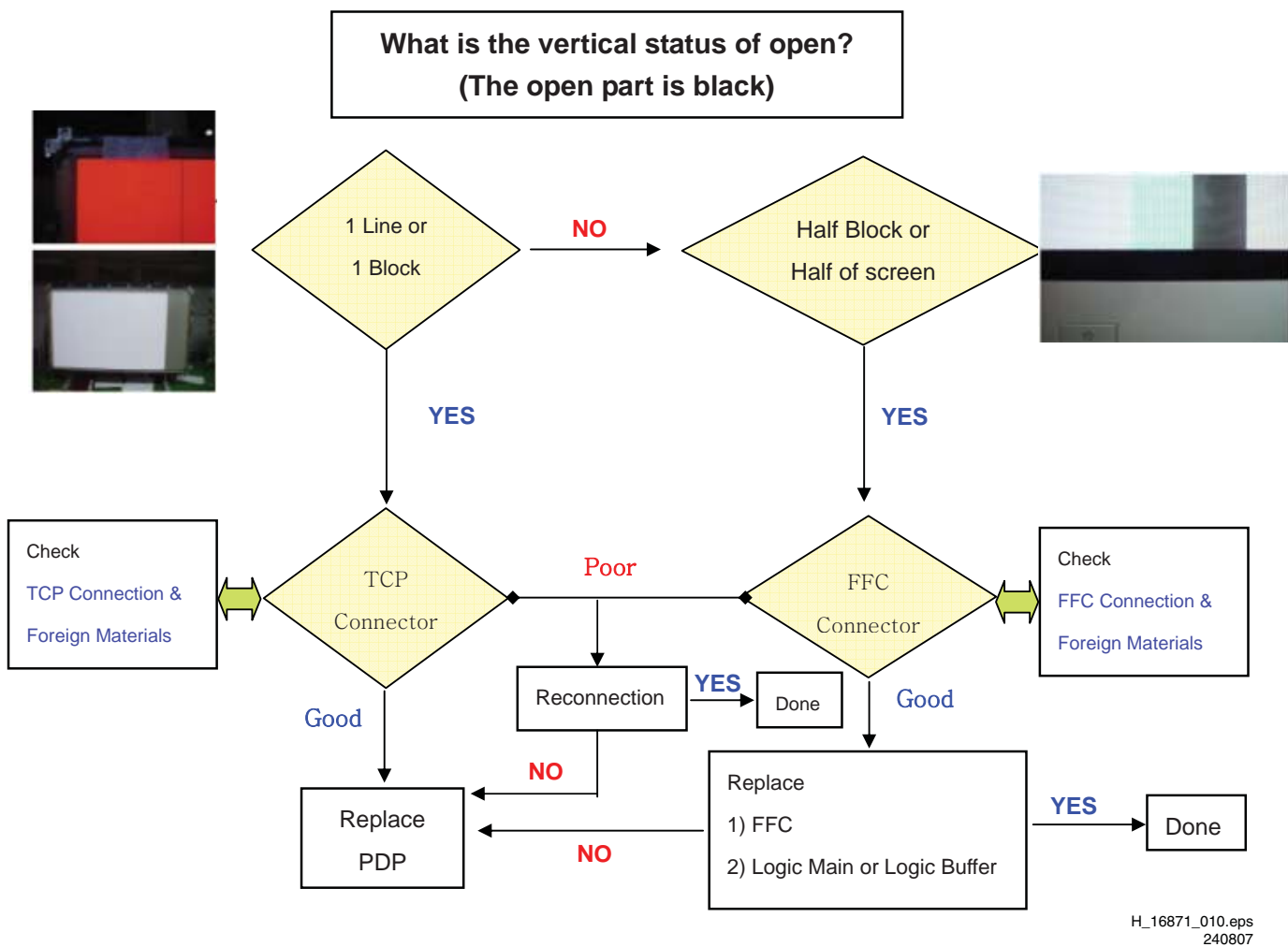


Figure 5-35 Fault symptom: "Address open" [2/2]

5.2.7 Address short (some vertical lines appear to be linked on the screen)

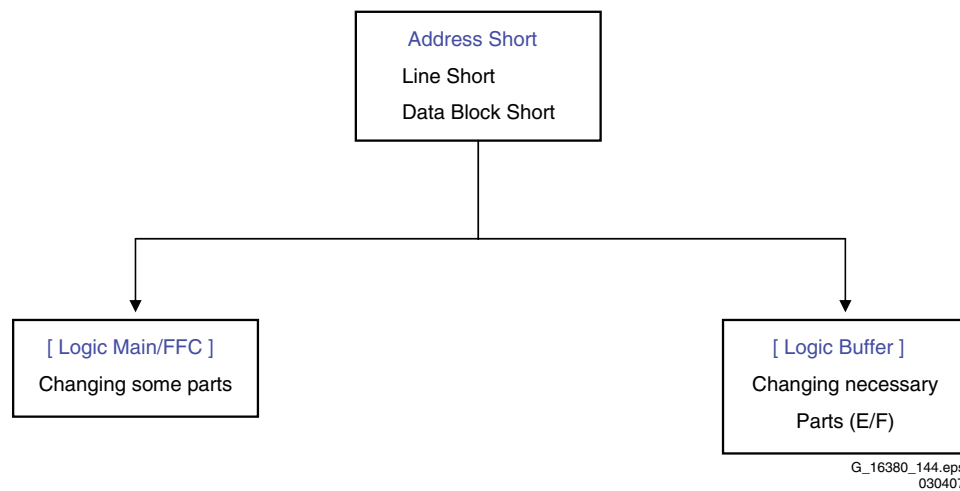


Figure 5-36 Fault symptom: "Address short" [1/2]

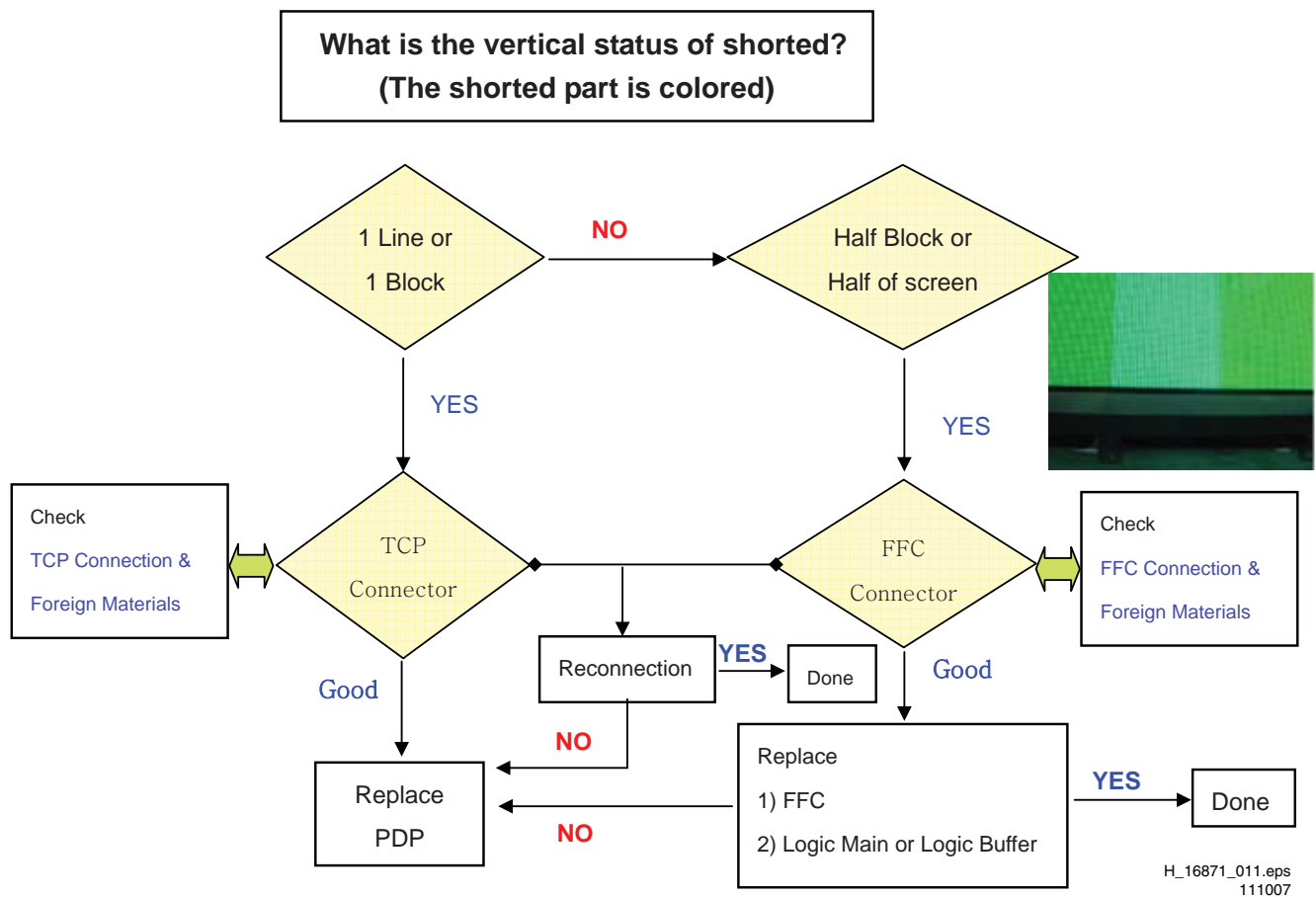


Figure 5-37 Fault symptom: "Address short" [2/2]

5.2.8 Criteria for Panel Replacement, due to Defective Panel Cells

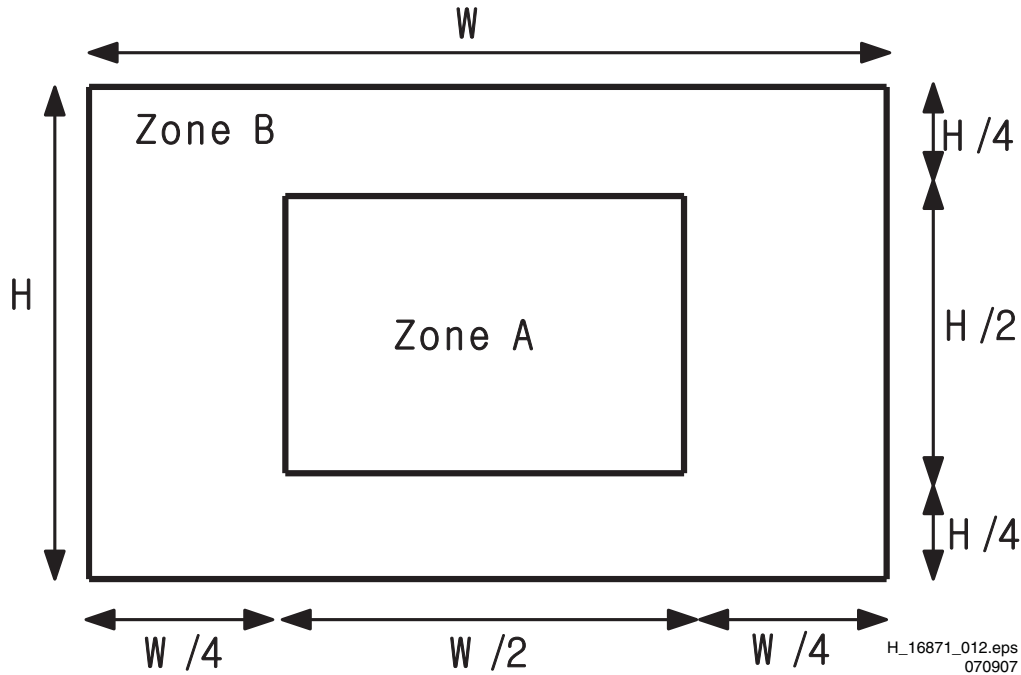


Figure 5-38 Panel zones

Item	Specification	
	Number of cell defects	Distance between cell defects
Non-lighting cell defect	Zone A: 4 and less Zone B: 8 and less	Regardless of A and B zone, 1 Cell Defect in an area of 50mm*50mm
Non-extinguishing cell defect	Zone A: 0 Zone B: 1 and less	
Flickering cell defect	Zone A: 0 Zone B: 1 and less	
High Intensity Cell defect	Zone A: 0 Zone B: 1 and less (Only Red & Blue)	
Adjacent cell defect	Zone A: 0 Zone B: 1 and less (Only Red & Blue)	
Total cell defects	12 and less	

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Figure 5-39 Criteria for panel replacement

5.2.9 Defect Overview

Table 5-2 Defects, symptoms and defective parts

Condition Name	Description	Related Board
No output voltage	Operating voltages don't exist.	SMPS
No display	Operating voltages exist, but no image on screen	Y-MAIN, X-MAIN, Logic Main, Cables
Abnormal display	Abnormal Image (not open or short) is on screen.	Y-MAIN, X-MAIN, Logic Main
Sustain open	Some horizontal lines are missing on screen	Scan Buffer, FPC of X / Y
Sustain short	Some horizontal lines appear to be linked on screen	Scan Buffer, FPC of X / Y
Address open	Some vertical lines are missing on screen	Logic Main, Logic Buffer, FFC, TCP
Address short	Some vertical lines appear to be linked on screen	Logic Main, Logic Buffer, FFC, TCP
Defective panel cells	Some cells seem to be defective	Check criteria for replacement of the panel

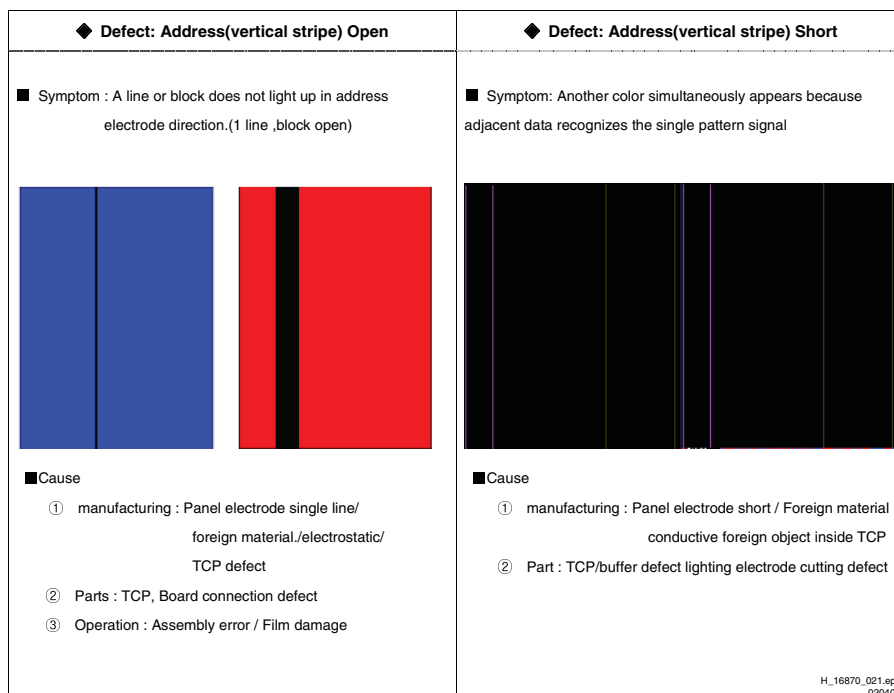


Figure 5-40 Defect overview [1/11]

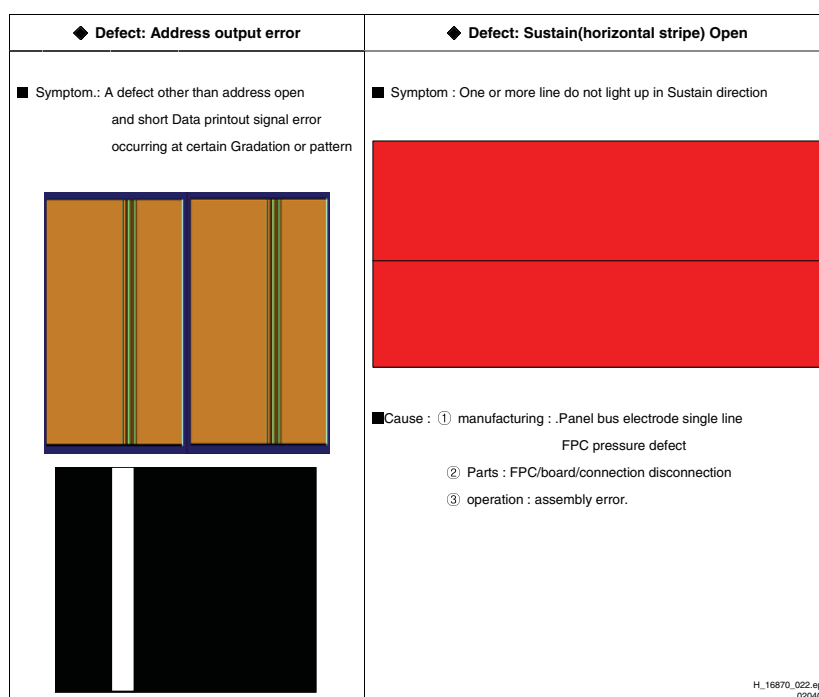










Figure 5-41 Defect overview [2/11]

◆ Defect: Sustain(horizontal stripe) Short	◆ Defect: Dielectric material layer damage
<p>■ Symptom : Combined or adjacent lines are short in sustain direction. The line appear brighter than other at Ramp gradation pattern or low gradation patter</p>   <p>■ Cause</p> <ol style="list-style-type: none"> ① manufacturing : Panel electrode short/Foreign material. ② Parts : Board/ connector/pin error ③ Operation : connector / assembling error 	<p>■ Symptom: Burn caused by the damage of address bus dielectric layer appears in the panel discharge/non discharge area. sustain also open/short occurs by the damage of address sustain printout</p>  <p><Add Block and Line Open></p>  <p><Add and Sustain Open></p> <p>■ Cause : layer uneven / abnormal voltage / foreign material repair failed</p>

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Figure 5-42 Defect overview [3/11]

◆ Defect: F/White low discharge	◆ Defect: Weak discharge
<p>■ Symptom : Low discharge caused by unstable cells occurring at full white pattern if high (60 degree) or normal temperature.</p>   <p>■ Cause</p> <ol style="list-style-type: none"> ① Panel : MgO source / dielectric thickness cell pitch/phosphor ② Circuit : drive waveform/ voltage condition 	<p>■ Symptom : Normal discharge but cells appear darker due to weak light emission occurring mainly at low (5 degree) Full white/Red/Green/Blue pattern or gradation pattern</p>   <p>■ Cause</p> <ol style="list-style-type: none"> ① Panel : MgO deposition count and thinckness / aging condition ② Circuit : drive waveform/ voltage condition

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Figure 5-43 Defect overview [4/11]

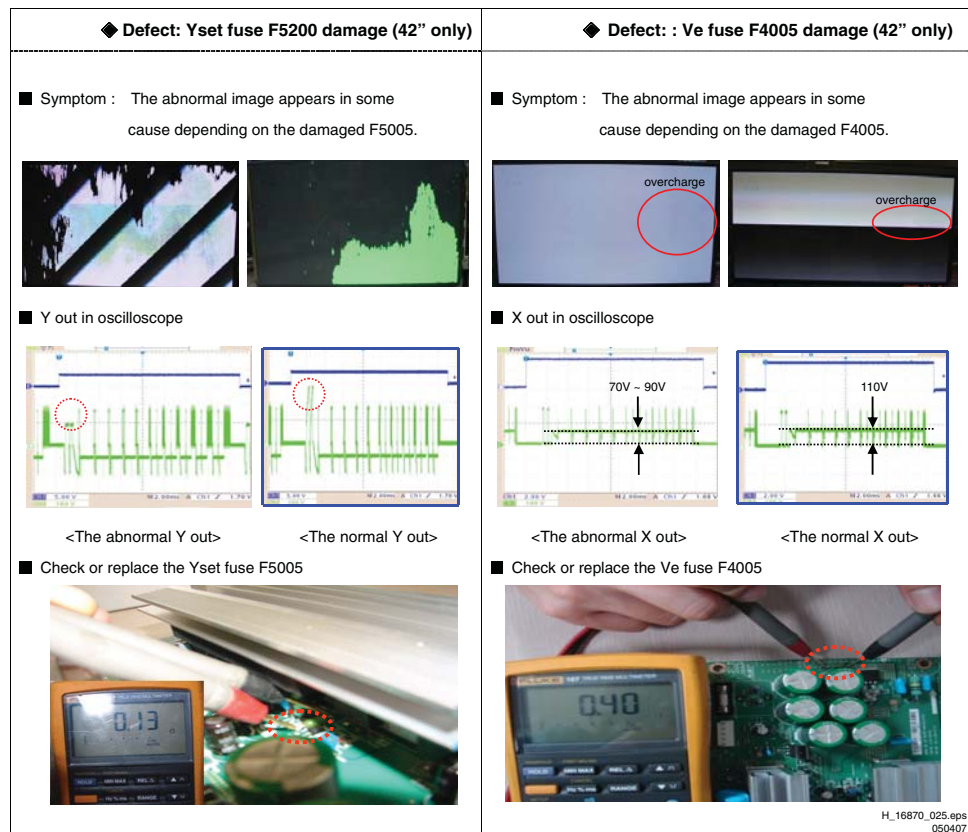


Figure 5-44 Defect overview 42" HD W2 [5/11]

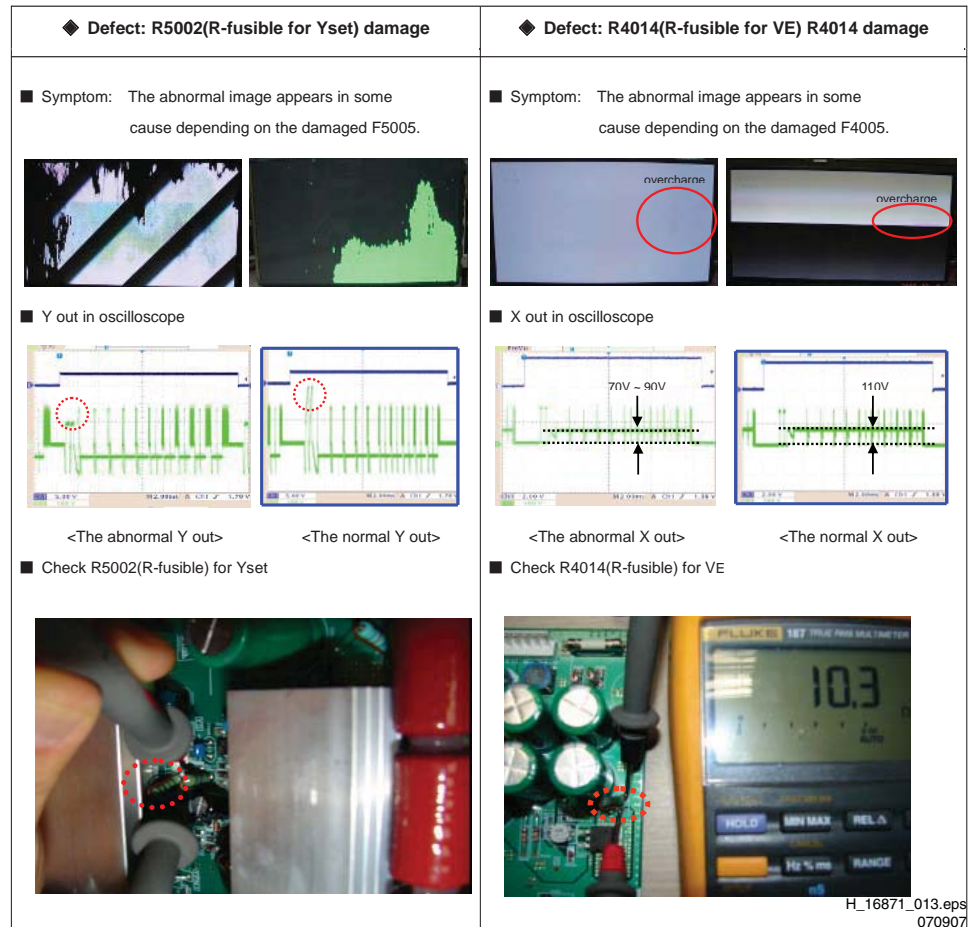

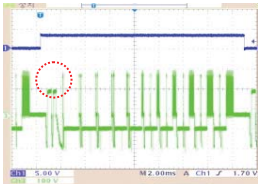
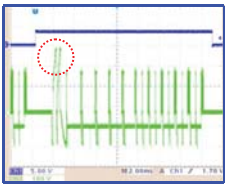

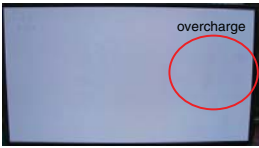
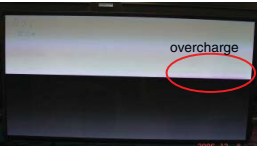
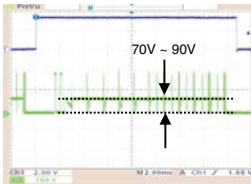
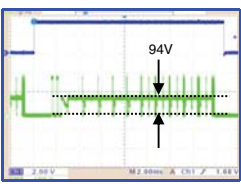
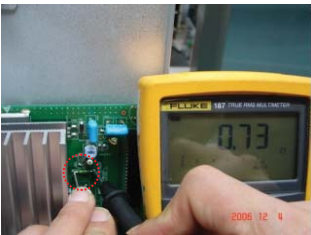
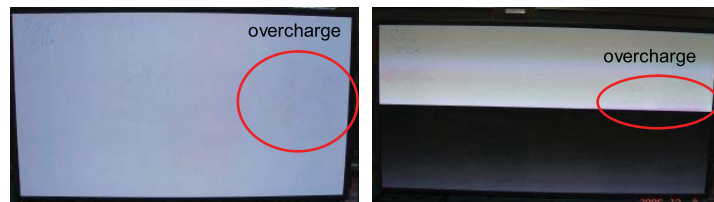


Figure 5-45 Defect overview 42" HD W2 Plus [6/11]

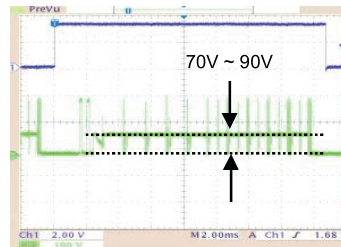
◆ Defect: Yset fuse F5200 damage (50" only)	◆ Defect: : Ve fuse F4800 damage (50" only)
<div>■ Symptom : The abnormal image appears in some cause depending on the damaged F5200.</div> <div></div> <div>■ Y out in oscilloscope</div> <div><div></div><div></div></div> <div><div><The abnormal Y out></div><div><The normal Y out></div></div> <div>■ Check or replace the Yset fuse F5200</div> <div></div>	<div>■ Symptom : The abnormal image appears in some cause depending on the damaged F4800.</div> <div><div></div><div></div></div> <div>■ X out in oscilloscope</div> <div><div></div><div></div></div> <div><div><The abnormal X out></div><div><The normal X out></div></div> <div>■ Check or replace the Ve fuse F4800</div> <div></div>

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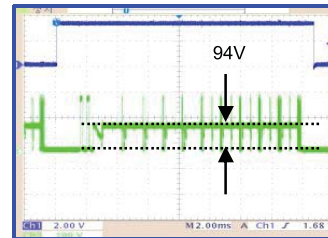
Figure 5-46 Defect overview 50" HD W2 [7/11]



■ X out in oscilloscope



<The abnormal X out>



<The normal X out>

■ Check or replace the Ve fuse F4800

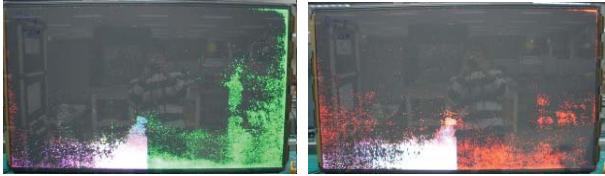


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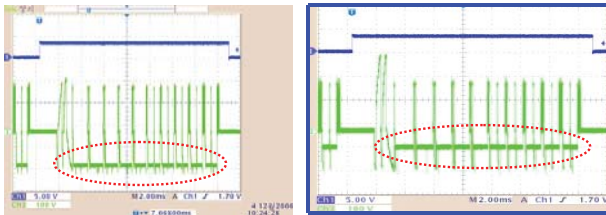
Figure 5-47 Defect overview 50" HD W2 Plus [8/11]

◆ Defect: Vsch voltage output is abnormal (50" only)

- Symptom : The abnormal image appears in some cause depending on abnormal Vsch voltage.



■ Y out in oscilloscope



<The abnormal Y out>

<The normal Y out>

- Check the Vsch voltage or replace the Y-Board



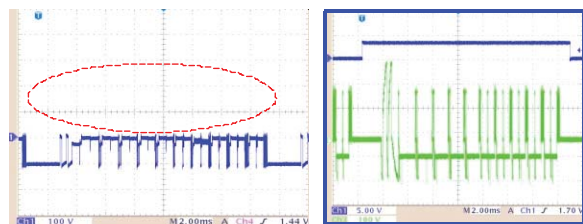
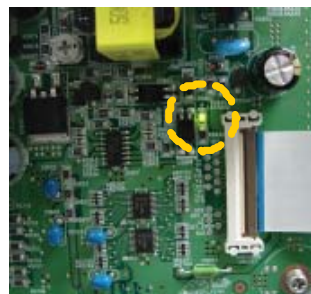
◆ Y-MAIN Protection Check (50" only)

■ Protection circuit

- Voltage Sensing : The important voltage sensing circuit
- Protection : This circuit compares Vref and each voltage using comparator
- Interface : DC/DC circuit which is connected with Photo-coupler, SCR
- Reporting : LED(Green) light on

■ Protection circuit behaviors

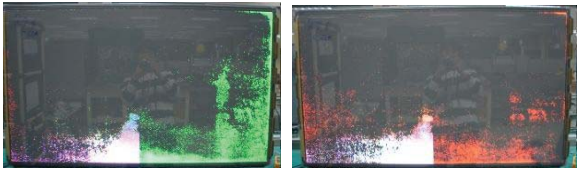
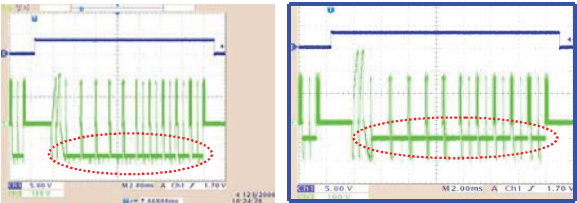
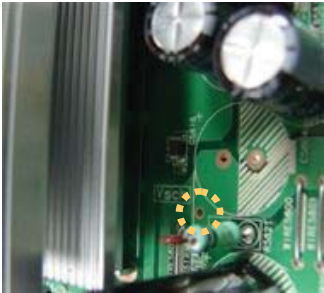
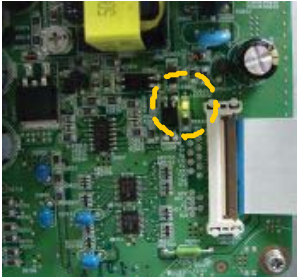
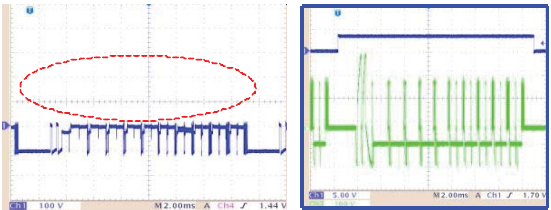
- Enable Circuit : This circuit enables protection circuit using Verc voltage
- Enable : (High, Verc> about 60V)
- Voltage sensing : Verc, Vscl, Vscl voltage sensing
 - Verc>130V(Normal 100V)
 - Vscl>-165V(Normal -190V)
 - Vsch<-100V(Normal -70V)
- Each comparator enables the protection circuit if any voltage is abnormal because this consists with AND Logic
- If SCR is enable DC/DC Controller(MR4710) F/B voltage is low(0.7V) and Vscl, Vscl, Vccf voltage is 0 level.
- Ypn, Ysc, Yfr, Scan I.C's behaviors stops and no display
- Protection reporting through LED lighting



The Protection Y out

The normal Y out

Figure 5-48 Defect overview 50" HD W2 [9/11]

<p>◆ Defect: Vsch voltage output is abnormal</p>	<p>◆ Y-MAIN Protection Check</p>
<p>■ Symptom : The abnormal image appears in some cause depending on abnormal Vsch voltage.</p>  <p>■ Y out in oscilloscope</p>  <p><The abnormal Y out> <The normal Y out></p> <p>■ Check the Vsch voltage or replace the Y-Board</p> 	<p>■ Protection circuit</p> <ul style="list-style-type: none"> - Voltage Sensing : The important voltage sensing circuit - Protection : This circuit compares the Vref and each voltage using comparator - Interface : DC/DC circuit which is connected with Photo-coupler, SCR - Reporting : LED(Green) light on <p>■ Protection circuit behaviors</p> <ul style="list-style-type: none"> - Enable Circuit : This circuit enables protection circuit using Verc voltage - Enable : (High, Verc> about 60V) - Voltage sensing : Verc, Vscl, Vsch voltage sensing <ul style="list-style-type: none"> Verc>130V(Normal 100V) Vscl>-165V(Normal -190V) Vsch<-100V(Normal -70V) - Each voltage comparator enables the protection circuit if any voltage is OVP because this consists with AND Logic - If SCR is enable DC/DC Controller(MR4710) F/B voltage is low(0.7V) and Vscl, Vscl, Vccf voltage is 0 level. - Ypn, Ysc, Yfr, Scan I.C's behaviors stops and no display appears - Protection reporting through LED lighting   <p>The Protection Y out The normal Y out</p>

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Figure 5-49 Defect overview 50" HD W2 Plus [10/11]

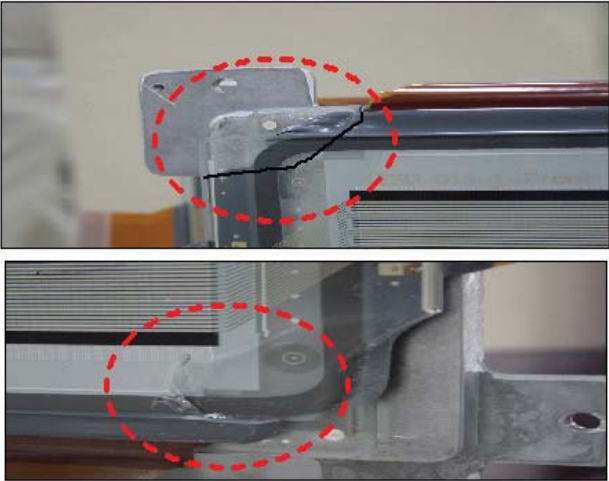
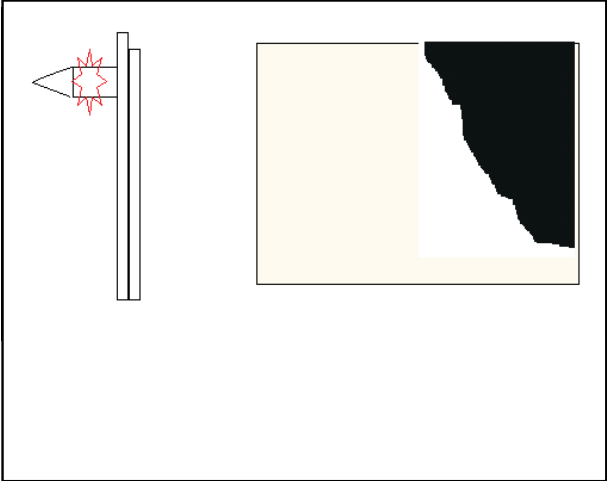
◆ Defect : panel damage	◆ Defect: Exhaust pipe damage
<p>■ Symptom : Panel crack or break. No image appears in some cause depending on the damaged parts and damage level.</p>  <p>■ Cause</p> <ul style="list-style-type: none"> ① Manufacturing : Flatness/palette pin interruption ② Operation : overload of panel corner / careless handling ③ Panel : Flatness / assembly error 	<p>■ Symptom. : Crack in break if exhaust pipe an image is partially lacking or the panel noise occurs depending on the damaged parts and with the passage of time</p>  <p>■ Cause : Careless panel handling</p> <p style="text-align: right;">H_16870_060.eps 130407</p>

Figure 5-50 Defect overview [11/11]

5.3 Defect Description Form

This form must be used by the workshops for warranty claims:

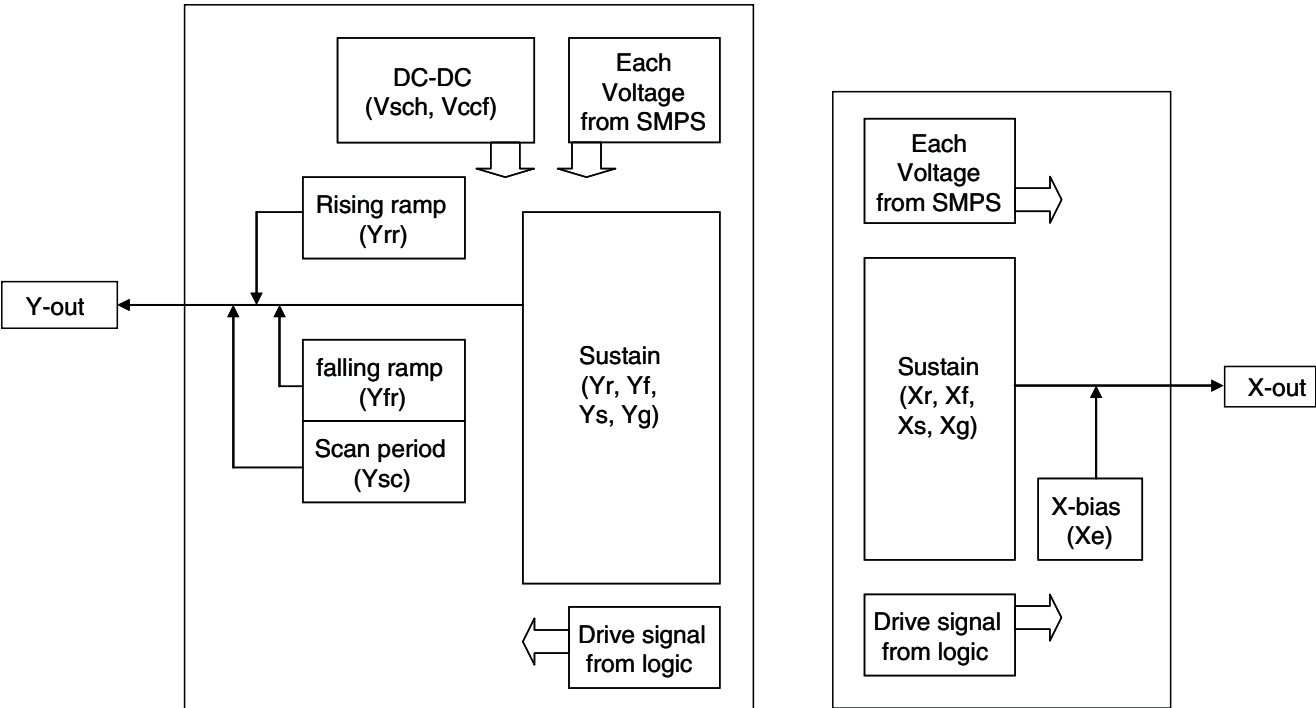
Defect Description Form LCD PLASMA v4.0 final				Date last modified: 28/03/2006	
To be filled in by <u>WORKSHOP / WORK CENTER</u>					
Country:	<div style="font-size: 1.5em; font-weight: bold;">PHILIPS</div> <div style="font-weight: bold;">LCD & Plasma</div> <div style="font-weight: bold; text-decoration: underline;">DEFECT DESCRIPTION FORM</div>		Type nr./Model nr. set		
Customer Account nr.:			Serial nr. set		
Job sheet nr.:			Type nr. display		
			Serial nr. display		
			Part nr display (12nc)		
			Return number		
GENERAL REPAIR DATA	Condition	<input type="checkbox"/> Constantly <input type="checkbox"/> Intermittently <input type="checkbox"/> After a while <input type="checkbox"/> In hot environment <input type="checkbox"/> In cold environment <div style="float: right; text-align: right;">Other: <div style="border: 1px solid black; height: 20px; width: 100%;"></div></div>			
	Symptom(s)	<input type="checkbox"/> No backlight <input type="checkbox"/> No picture <input type="checkbox"/> Picture too bright <input type="checkbox"/> Scratches (LCD only acc. Pixel criteria sheet V4.0) <input type="checkbox"/> Only partial picture <input type="checkbox"/> Unstable picture <input type="checkbox"/> Flickering / flashing picture <input type="checkbox"/> Lines across/down image <input type="checkbox"/> Inactive row(s) <input type="checkbox"/> Inactive column(s) <input type="checkbox"/> Missing colour(s) <input type="checkbox"/> Light leakage <div style="float: right; text-align: right;">Other: <div style="border: 1px solid black; height: 80px; width: 100%;"></div></div>			
PANEL REPAIR	Pixel Defect(s):	Dark dots Bright dots	<u>Qty of dots:</u>	Mark Defect(s):	
	Symptoms <u>Out of warranty</u>	Following defect symptoms are out of warranty: <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> - Broken glass / Broken polarizer - Scratch(es) on display / polarizer </div> <div style="width: 45%;"> - Number of dark/bright pixels within spec. - Burn in (Plasma TV) / Sticking image (LCD TV) - MURA </div> </div>			These symptoms are not claimable.
BOARD REPAIR	Defect Board		New Board		
	Spare Part Nr.	Serial Nr.	Spare Part Nr.	Serial Nr.	
	1.				
	2.				
	3.				
	4.				
<p>Note 1: The defective LCD-panel / PDP needs to be returned in the same packaging as the new part was send. If not the warranty claim will be rejected.</p> <p style="text-align: right;">DE10WEG</p> <p>Owner: PHILIPS CE EUROSERVICE</p>					

Figure 5-51 Defect Description Form (DDF)

6. Block Diagrams, Test Point Overview, and Waveforms

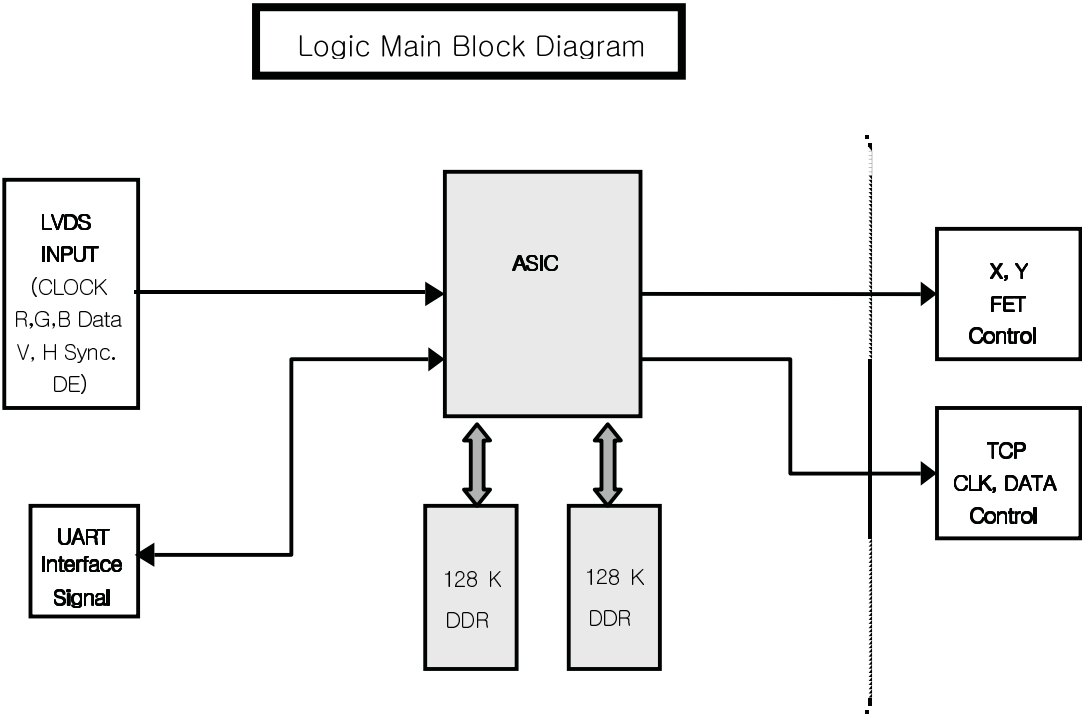
Index of this chapter:
6.1 Block Diagrams

6.1 Block Diagrams



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Figure 6-1 Block diagram “Driver” circuits: Y-Main (left) and X-Main (right)



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Figure 6-2 Block diagram “Logic Main” circuit

7. Circuit Diagrams and PWB Layouts

Not applicable.

8. Alignments

- Index of this chapter:**
- 8.1 Power Supply Voltages
 - 8.2 Alignments 42" HD W2
 - 8.3 Alignments 42" HD W2 Plus
 - 8.4 Alignments 50" HD W2 & 50" HD W2 Plus

Note:

- Figures can deviate due to the different model executions.

Important: Remove all non-default jumpers and reset all DIP switches, after the repair!

8.1 Power Supply Voltages

8.1.1 PSU Layout

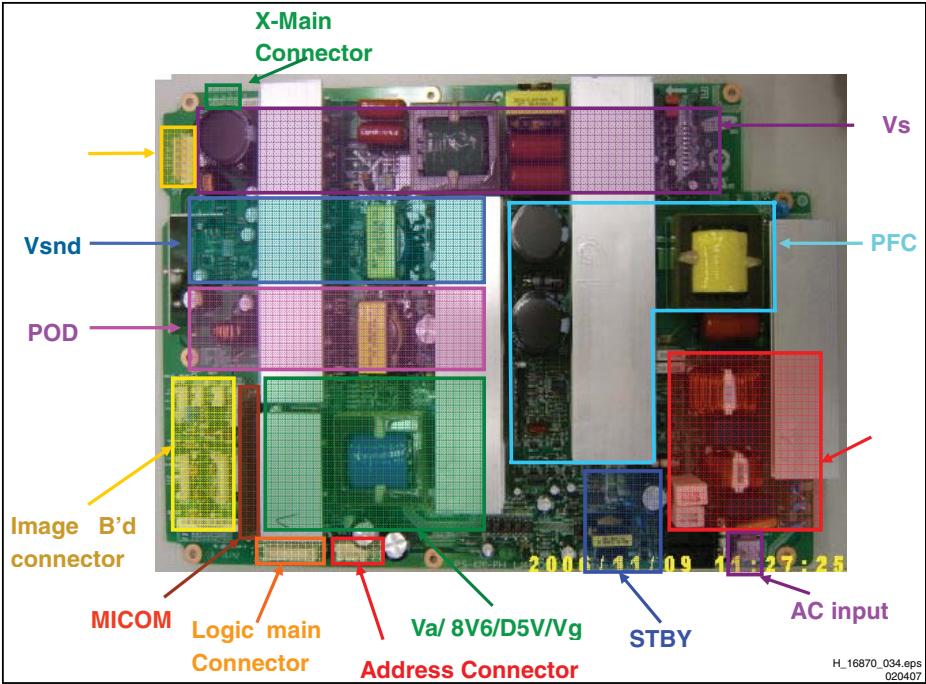


Figure 8-1 PSU layout 42" HD W2

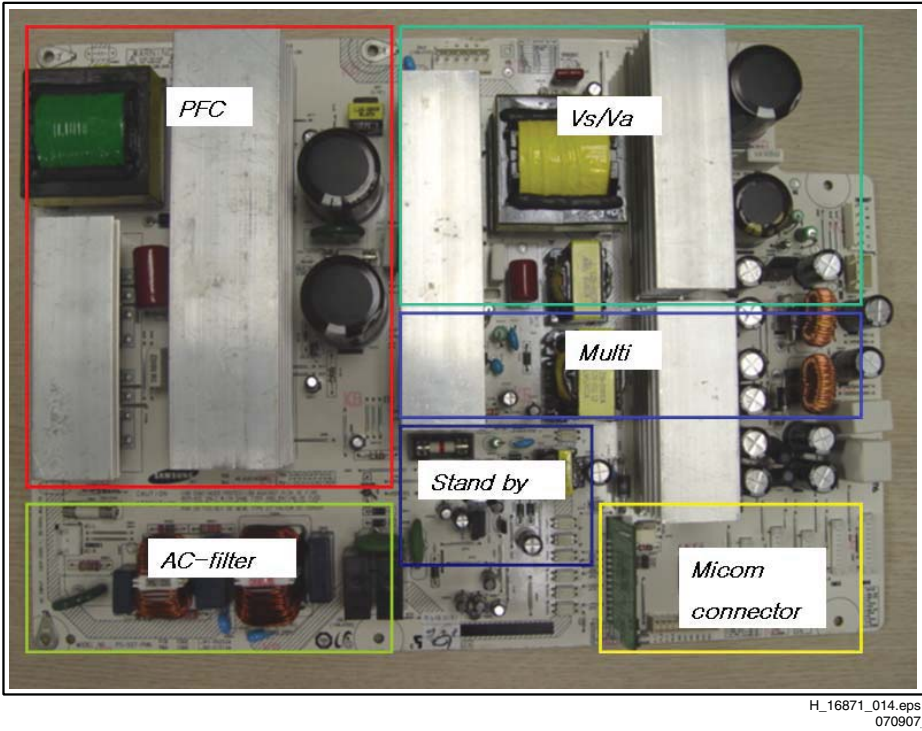


Figure 8-2 PSU layout 42" HD W2 Plus

8.1.2 Adjustment Power Supply Voltages 42" HD W2

Table 8-1 Adjustment voltage level overview (also refer to the sticker on the rear side of the panel)

No	Output voltage (V)	Voltage Setting (Normal Load)	Output Voltage Range
1	VS	205 V ± 1.5%	200 V ~ 207 V
2	VA	63 V ± 1.5%	60 V ~ 65 V
3	VE	110 V ± 1.5%	100 V ~ 120 V
4	VSCAN	-190 V ± 1.5%	-200 V ~ -185 V
5	VG	15 V ± 5%	Fixed
6	D5VL	5.2 V ± 5%	Fixed

Check voltage label on the PDP for correct values.

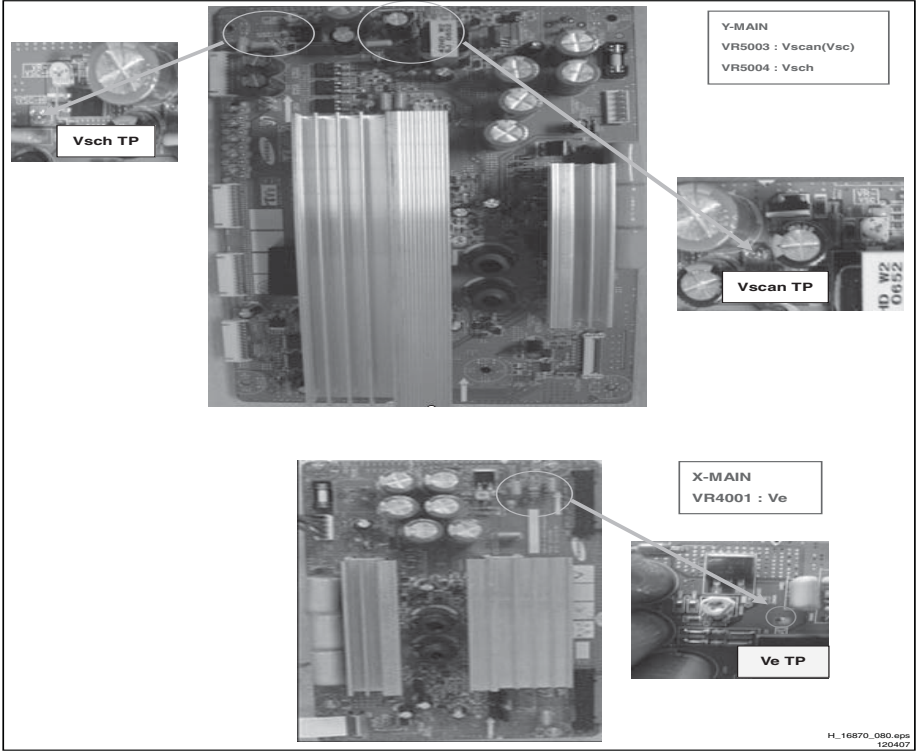


Figure 8-5 Location of voltage check points - 42" HD W2

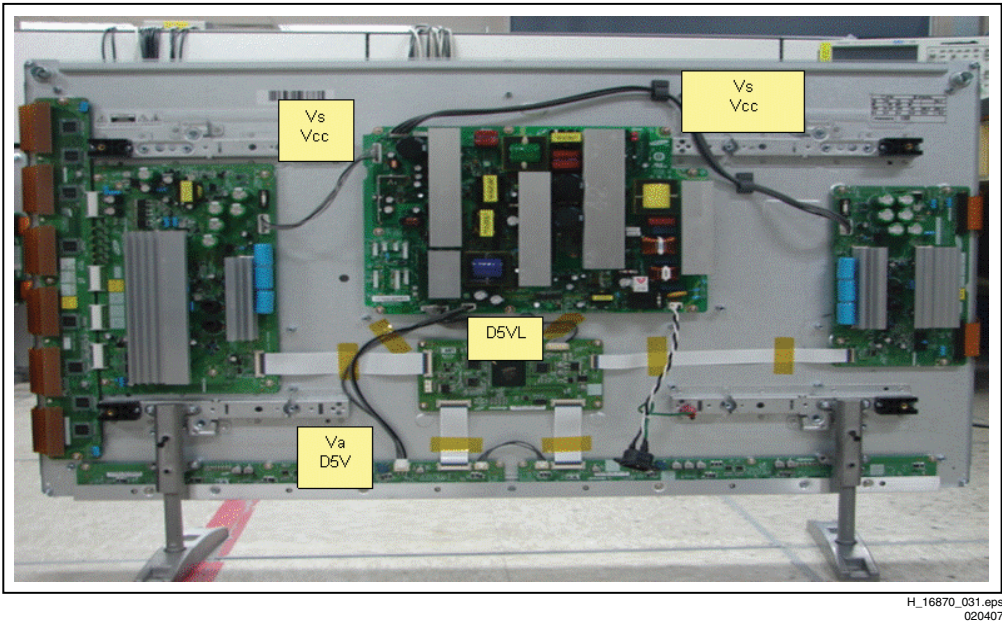


Figure 8-6 Location of the supply lines from the PSU to the boards - 42" HD W2

8.1.3 Adjustment Power Supply Voltages 42" HD W2 Plus

Table 8-2 Adjustment voltage level overview (also refer to the sticker on the rear side of the panel)

No	Output voltage (V)	Voltage Setting (Normal Load)	Output Voltage Range
1	VS	205 V \pm 1.5%	200 V ~ 215 V
2	VA	63 V \pm 1.5%	61 V ~ 65 V
3	VE	99 V \pm 1.5%	95 V ~ 105 V
4	VSCAN	-190 V \pm 1.5%	-195 V ~ -185 V
5	VG	15 V \pm 5%	Fixed
6	D5VL	5.2 V \pm 5%	Fixed

Check voltage label on the PDP for correct values.

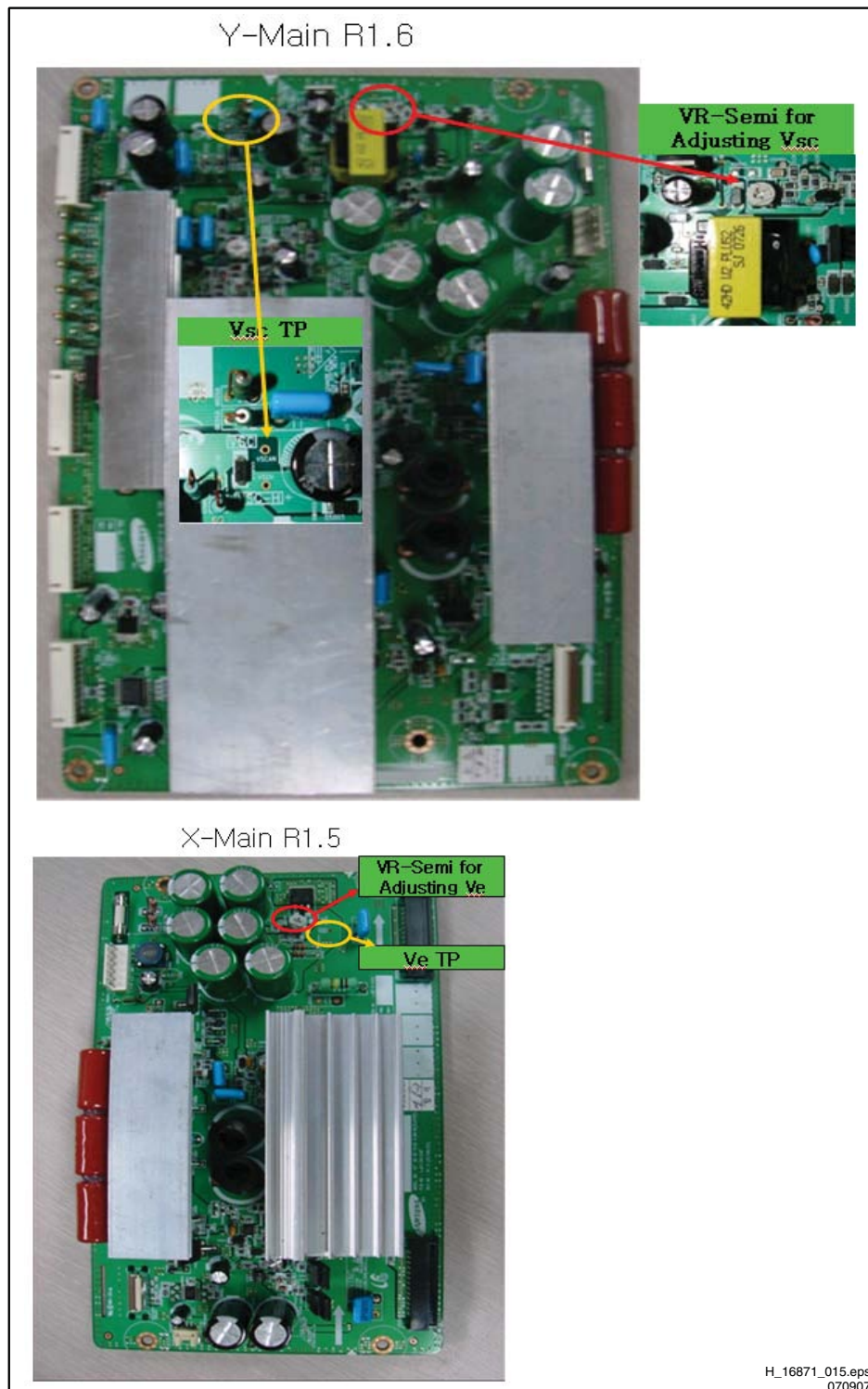
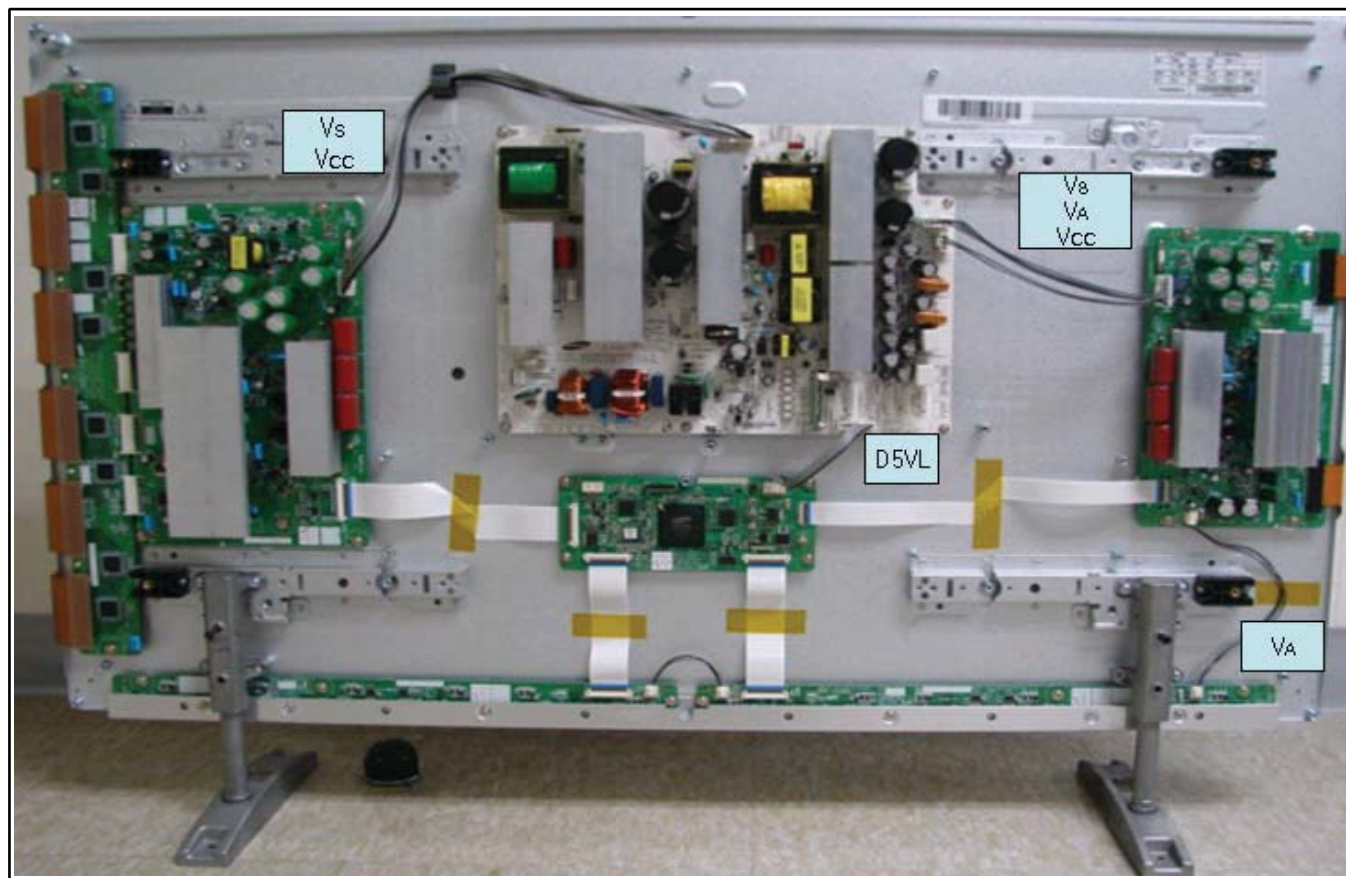


Figure 8-7 Location of voltage check points - 42" HD W2 Plus



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Figure 8-8 Location of the supply lines from the PSU to the boards - 42" HD W2 Plus

8.1.4 Adjustment Power Supply Voltages 50" HD W2

Table 8-3 Adjustment voltage level overview (also refer to the sticker on the rear side of the panel)

No	Output voltage (V)	Voltage Setting (Normal Load)	Output Voltage Range
1	VS	207 V \pm 1.5%	198 V ~ 202 V
2	VA	63 V \pm 1.5%	63 V ~ 67 V
3	VE	94 V \pm 1.5%	105 V ~ 115 V
4	VSCAN	-190 V \pm 1.5%	-192 V ~ -188 V
5	VG	15 V \pm 5%	Fixed
6	D5VL	5.2 V \pm 5%	Fixed

Check voltage label on the PDP for correct values.

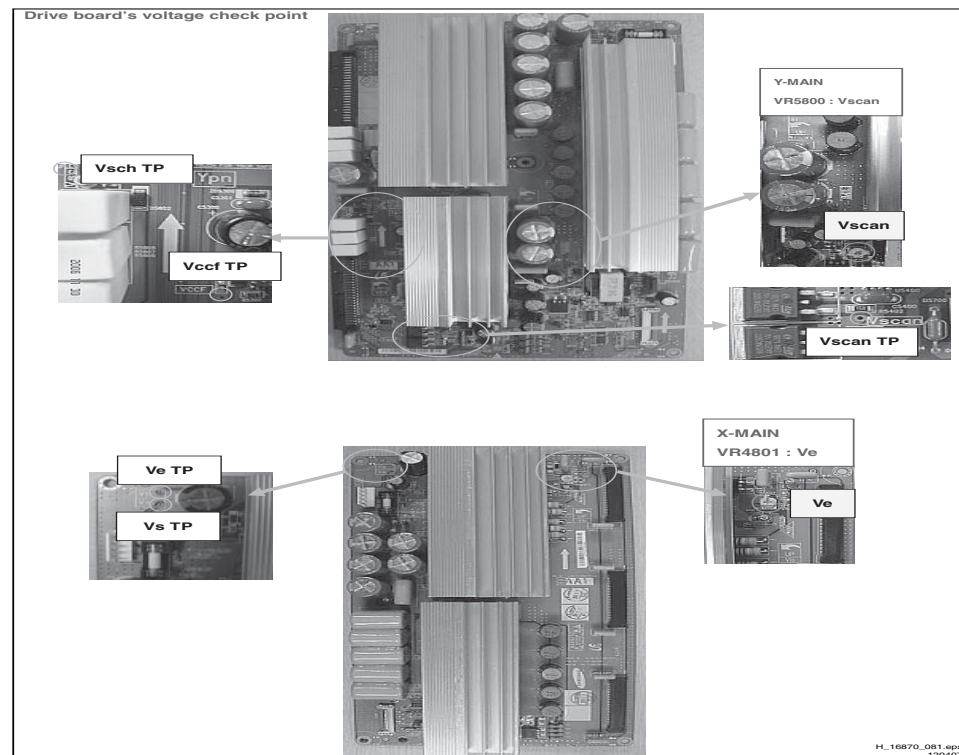


Figure 8-9 Location of the voltage check points - 50" HD W2

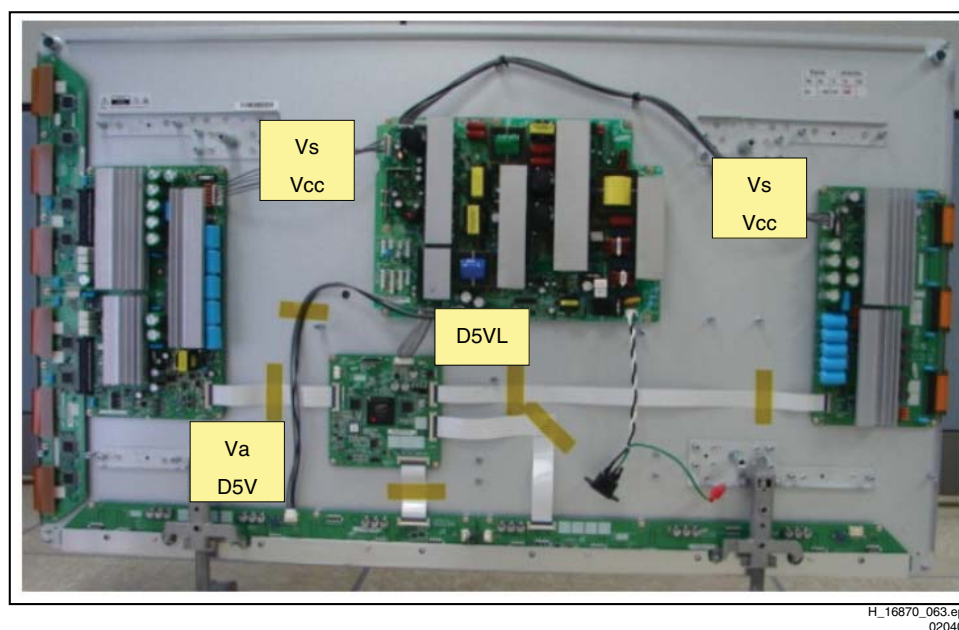


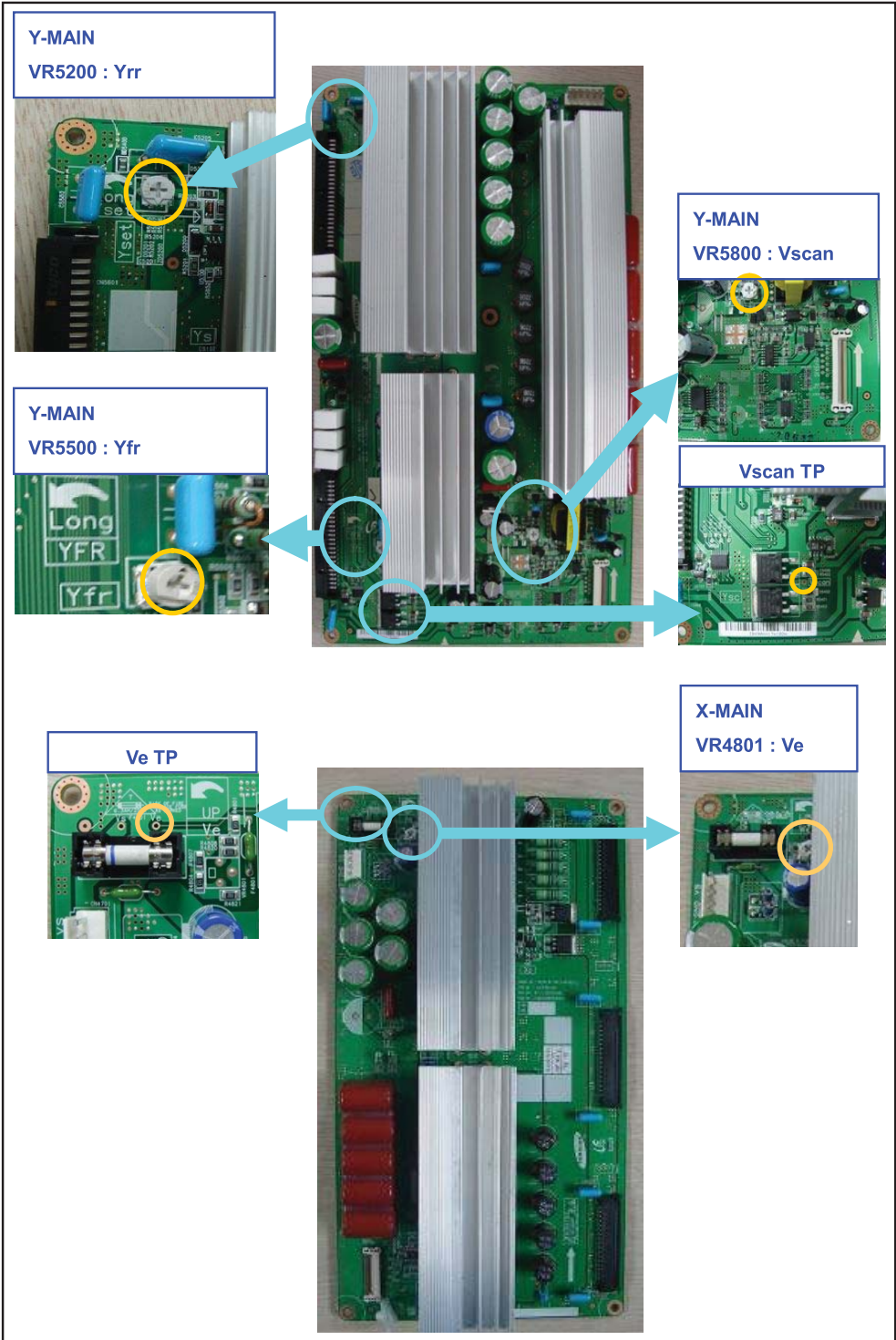
Figure 8-10 Location of the supply lines from the PSU to the boards - 50" HD W2

8.1.5 Adjustment Power Supply Voltages 50" HD W2 Plus

Table 8-4 Adjustment voltage level overview (also refer to the sticker on the rear side of the panel)

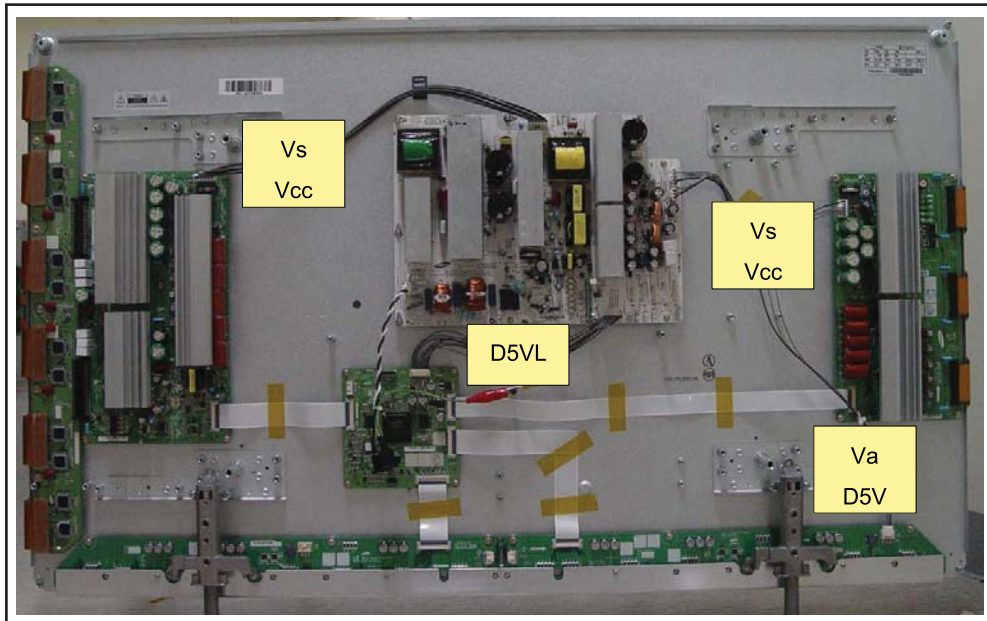
No	Output voltage (V)	Voltage Setting (Normal Load)	Output Voltage Range
1	VS	207 V ± 1.5%	200 V ~ 215 V
2	VA	63 V ± 1.5%	Fixed
3	VE	94 V ± 1.5%	105 V ~ 115 V
4	VSCAN	-190 V ± 1.5%	-192 V ~ -188 V
5	VG	15 V ± 5%	Fixed
6	D5VL	5.3 V ± 5%	Fixed

Check voltage label on the PDP for correct values.



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Figure 8-11 Location of the voltage check points - 50" HD W2 Plus



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191007

Figure 8-12 Location of the supply lines from the PSU to the boards - 50" HD W2 Plus

8.2 Alignments 42” HD W2

8.2.1 Quick Check

For a quick check on the correct Y-main waveform alignment, use the following method: Check the position of the potmeter VR5003 [1]. If it points in this direction [2], use a trimmer [3] to return it to the correct position [1].

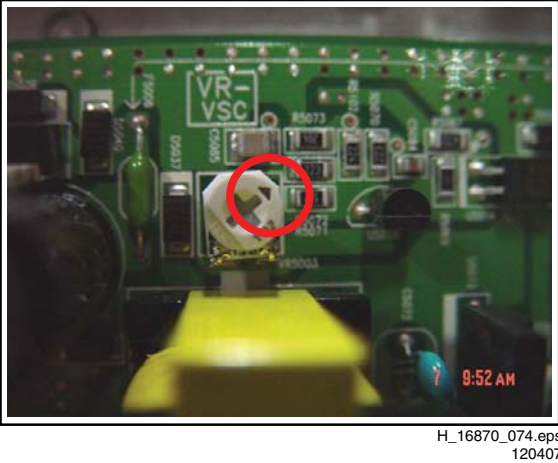


Figure 8-13 Correct position of VR5003 [1]

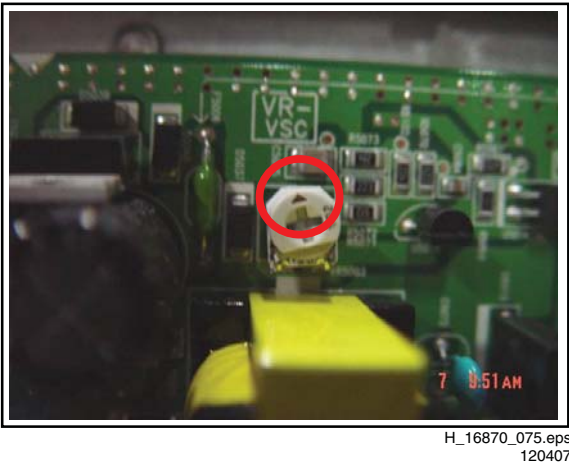


Figure 8-14 Wrong position of VR5003 [2]

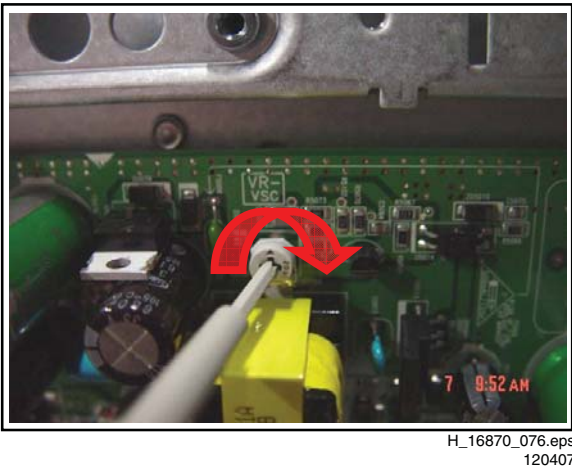


Figure 8-15 Changing of VR5003 [3]

8.2.2 For Reference Only

- If the quick check does not solve the issue, perform the following alignments:
- Set the pattern to “Full White”:
 - Place jumper CN2013 (pins 3 and 4) on the Logic Board
 - The display starts showing a cycle of different patterns. At the moment the “full white” pattern is visible, remove the jumper. Now the display shows a continuous full white pattern. To restart the cycle of different patterns, replace the jumper.
 - Check the waveform using an oscilloscope (see figures “Adjusting waveforms - 42” HD W2”).
 - Trigger via V_TOGG on the LOGIC Board (see figure “Logic PWB 42” HD W2”).
 - Connect the “CN5411” test point, located at the bottom of the Y-buffer PWB, to the other channel, and then check the first SubField (SF) waveform of one TV-Field.
 - Check the waveform by adjusting the “horizontal division” of the oscilloscope.
 - Check the Reset waveform when the V_TOGG level is changed.
 - Adjust the waveform of the rising ramp with VR5001.
 - Adjust the waveform of the falling ramp with VR5002.

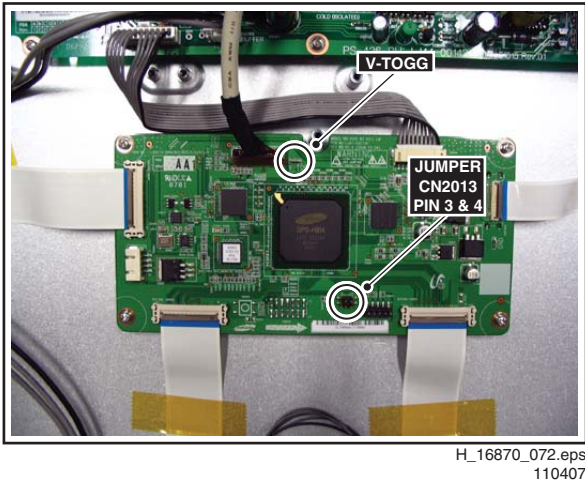


Figure 8-16 Logic PWB - 42” HD W2

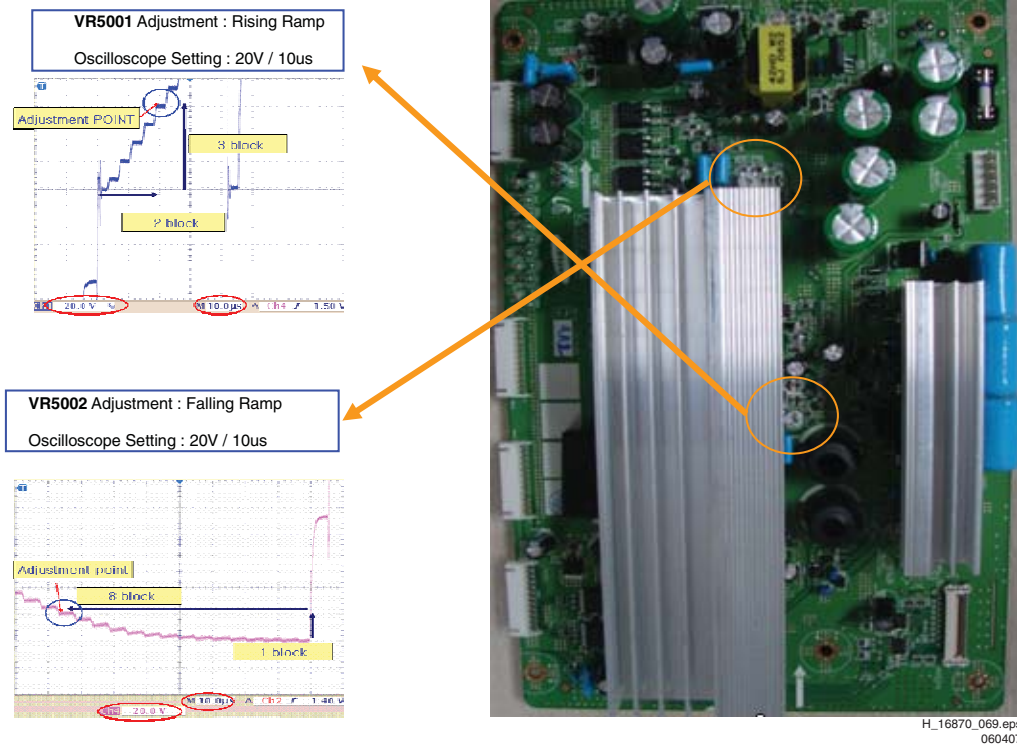
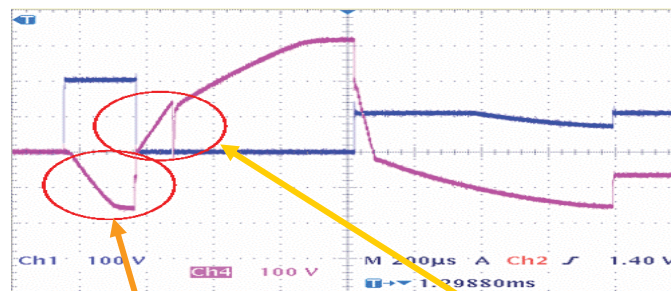


Figure 8-17 Adjusting waveforms - 42" HD W2 [1/2]



Adjust VR5002 to set the time of Yfr
(Main Reset Falling Ramp) like the
below picture.

Oscilloscope Setting : 20V / 10us

Adjust VR5001 to set the time of Yrr
(Main Reset Rising Ramp) like the
below picture.

Oscilloscope Setting : 20V / 10us

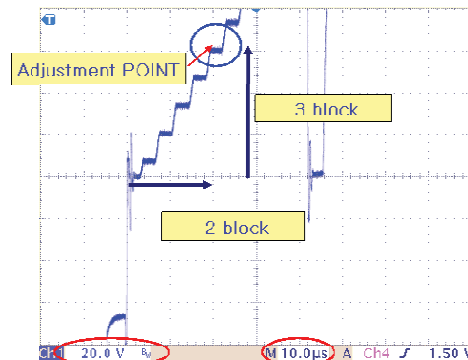
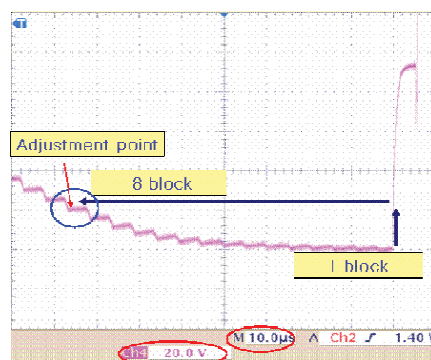


Figure 8-18 Adjusting waveforms - 42" HD W2 [2/2]

8.3 Alignments 42" HD W2 Plus

8.3.1 Quick Check

For a quick check on the correct Y-main waveform alignment, use the following method: Check the position of the potmeter VRsc (scan), see Figure "Correct position of VR for Vsc (scan) on Y-Main". If necessary, use a trimmer to return it to its correct position.

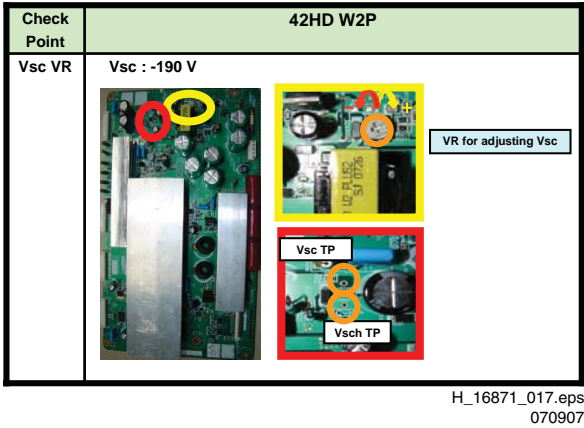


Figure 8-19 Correct position of VR for Vsc (scan) on Y-Main

8.3.2 For Reference Only

If the quick check does not solve the issue, perform the PSU (SMPS) and other alignments, as indicated in alignment pages of the W2 models. The W2 Plus PDP alignments are equivalent to those of the W2 PDP models, but there are some minor differences in the locations of test points and VRs. The differences (locations of test points and VRs) are shown in the photo above and the photos below.

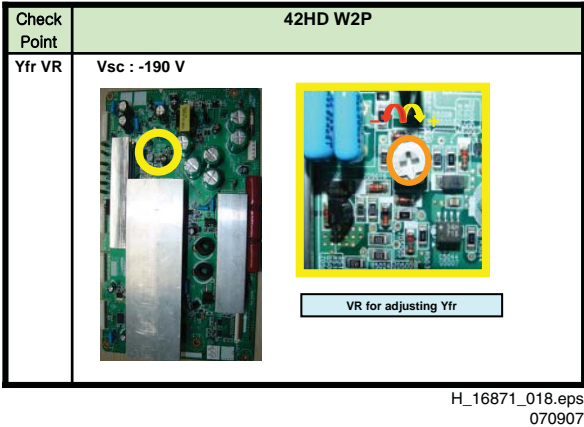


Figure 8-20 Y-Main: Vr for adjusting Yfr

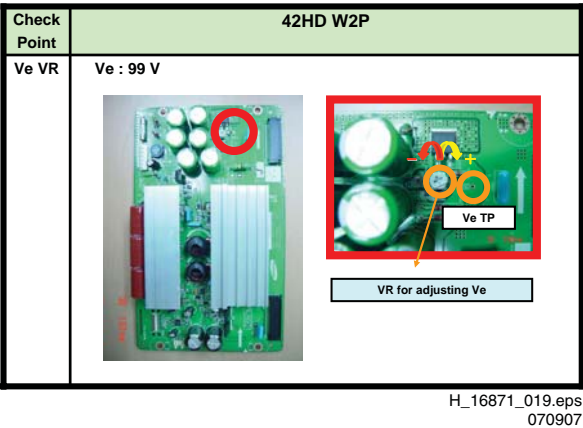


Figure 8-21 X-Main: VR for adjusting Ve

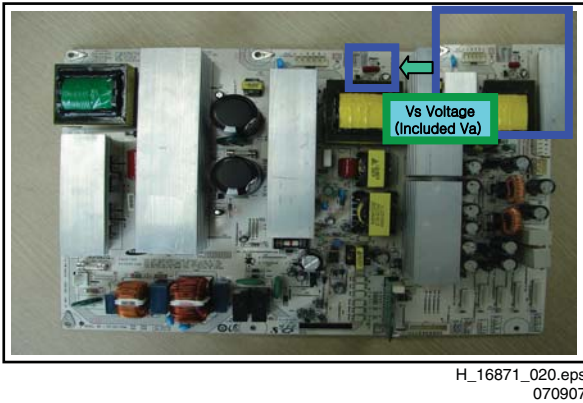


Figure 8-22 SMPS: VR for adjusting Vs

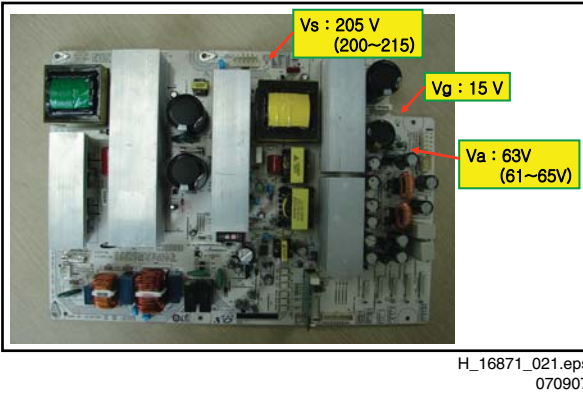


Figure 8-23 SMPS: Voltage measuring points

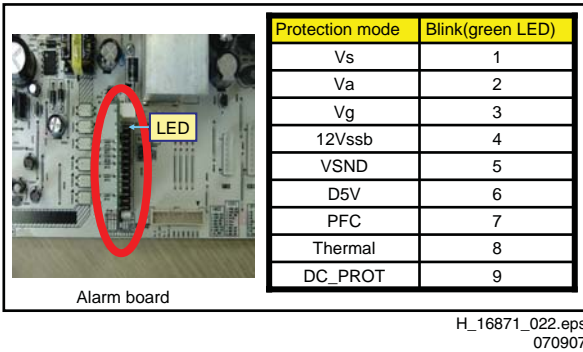
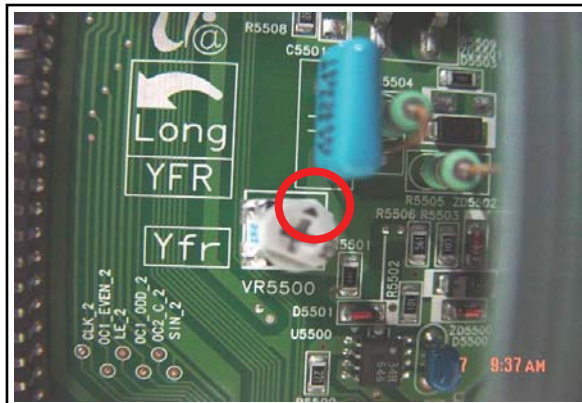


Figure 8-24 SMPS: Protection mode (Display Ramp)

8.4 Alignments 50" HD W2 & 50" HD W2 Plus

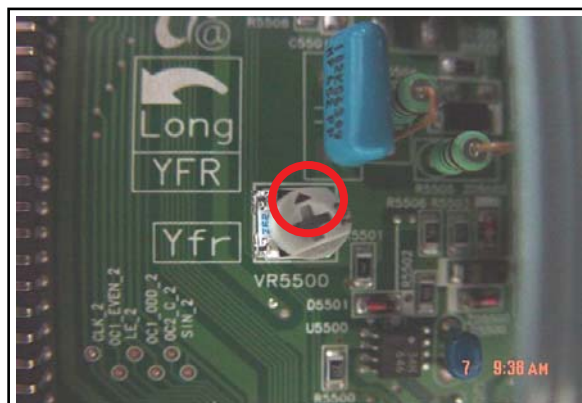
8.4.1 Quick Check

For a quick check on the correct Y-main waveform alignment, use the following method: Check the position of the potmeter VR5500 [1]. If it points in this direction [2], use a trimmer [3] to return it to the correct position [1].



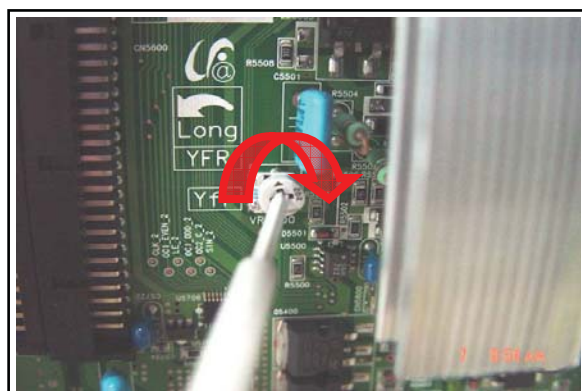
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Figure 8-25 Correct position of VR5500 [1]



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120407

Figure 8-26 Wrong position of VR5500 [2]



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120407

Figure 8-27 Changing of VR5500 [3]

8.4.2 For Reference Only

- Set the pattern to Full White:
 - Place jumper CN2007 (pins 3 and 4) on the Logic Board
 - When the display starts showing a cycle of different patterns, push button SW2000 for at least one second. Now the display shows a continuous full white pattern. To restart the cycle of different patterns, push the button once more and wait for a few seconds.
- Check the waveform using an oscilloscope (see figures "Adjusting waveforms - 50" HD W2").
 - Trigger via V_TOGG on the Logic Board (see figure "Logic PWB 50" HD W2").
 - Connect the "OUT240" test point, located at the centre of the Y-buffer PWB, to the other channel, and then check the first Sub-Field (SF) waveform of one TV-Field.
 - Check the waveform by adjusting the "horizontal division" of the oscilloscope.
 - Check the waveform when the V_TOGG level is changed.
- Adjust the waveform of the rising ramp with VR5200.
- Adjust the waveform of the falling ramp with VR5500.

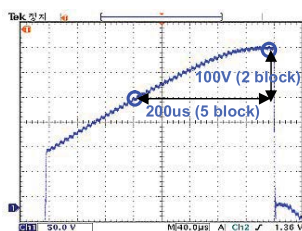


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Figure 8-28 Logic PWB - 50" HD W2

VR5200 Adjustment : Rising Ramp

Oscilloscope Setting : 50V / 40us



VR5500 Adjustment : Falling Ramp

Oscilloscope Setting : 50V / 20us

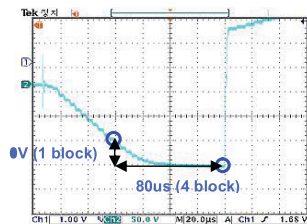
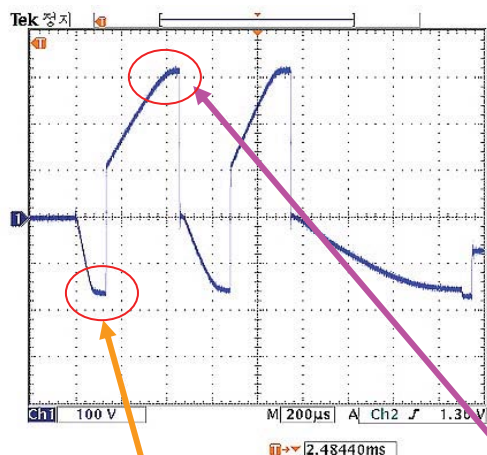


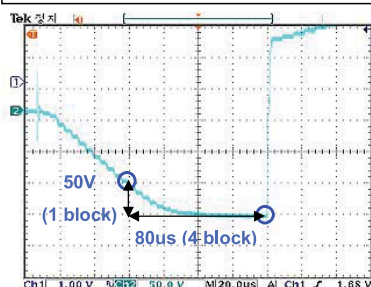
Figure 8-29 Adjusting waveforms - 50" HD W2 & 50 HD W2 Plus [1/2]

W2 Ramp Waveform Inclination Adjustment (Y-Board) - 1st Sub Field



Adjust VR5500 to set the time of Yfr
(Main Reset Falling Ramp) like the
below picture.

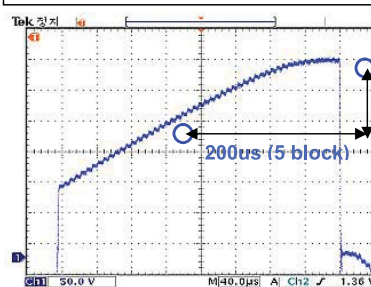
Oscilloscope Setting : 50V / 20us



< Falling Ramp >

Adjust VR5200 to set the time of Yrr
(Main Reset Rising Ramp) like the
below picture.

Oscilloscope Setting : 50V / 40us



< Rising Ramp >

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Figure 8-30 Adjusting waveforms - 50" HD W2 & 50 HD W2 Plus [2/2]

9. Circuit Descriptions, Abbreviation List, and IC Data Sheets

Index of this chapter:

- 9.1 Main Function of Each Assembly
- 9.2 Abbreviation List
- 9.3 IC Data Sheets

9.1 Main Function of Each Assembly

9.1.1 X Main Board

The X Main board generates a drive signal by switching the FET and IGBT in synchronization with logic main board timing, and supplies the X electrode of the panel with the drive signal through the connector.

1. Maintain voltage waveforms (including ERC).
2. Generate X rising ramp signal.
3. Maintain Ve bias between Scan intervals.

9.1.2 Y Main Board

The Y Main board generates a drive signal by switching the FET and IGBT in synchronization with the logic Main Board timing and sequentially supplies the Y electrode of the panel with the drive signal through the scan driver IC on the Y-buffer board. This board connected to the panel's Y terminal has the following main functions.

1. Maintain voltage waveforms (including ERC).
2. Generate Y-rising Falling Ramp.
3. Maintain V scan bias.

9.1.3 Logic Main Board

The Logic Main board generates and outputs the address drive output signal and the X,Y drive signal by processing the video signals. This board buffers the address drive output signal and feeds it to the address drive IC (TCP module, video signal- X Y drive signal generation, frame memory circuit / address data re-arrangement).

9.1.4 Logic Buffer (E, F)

The Logic Buffer transmits the data and control signals.

9.1.5 Y Buffer Board

The Y Buffer board supplies the Y-terminal with scan waveforms. The board comprises eight scan driver ICs.

9.1.6 TCP (Tape Carrier Package)

The TCP applies the Va pulse to the address electrode and constitutes address discharge by the potential difference between the Va pulse and the pulse applied to the Y electrode. The TCP comprise one data driver IC. Twelve (42") or sixteen (50") TCPs are required for signal scan.

9.2 Abbreviation List

AC	Alternating Current
COF	Circuit On Foil
DC	Direct Current
ERC	Energy Recovery Circuit
ESD	Electro Static Discharge
FET	Field Effect Transistor
FFC	Flat Foil Cable
FPC	Flexible Printed Circuit
FTV	Flat TeleVision
HD	High Definition
I/O	Input/Output
IC	Integrated Circuit
IGBT	Insulated Gate Bipolar Transistor
LB	Logic Buffer
LED	Light Emitting Diode
LVDS	Low Voltage Differential Signalling
PCB	Printed Circuit Board (same as PWB)
PDP	Plasma Display Panel
PSU	Power Supply Unit
PWB	Printed Wiring Board (same as PCB)
RGB	Red, Green, Blue colour space
SD	Standard Definition
SDI	Samsung Display Industry (supplier)
SMPS	Switched Mode Power Supply
SSB	Small Signal Board
SF	Sub Field
TCP	Tape Carrier Package
VR	Variable Resistor
Vsc	Scan Voltage
YBL	Y Buffer Lower board
YBU	Y Buffer Upper board
YM	Y Main board

9.3 IC Data Sheets

Not applicable.

10. Spare Parts List

Please refer to the Philips Service website, for an actual overview (monthly updated).

11. Revision List

Manual xxxx xxx xxxx.0

- First release.

Manual xxxx xxx xxxx.1

- Information on 42 inch HD W2 Plus PDP (S42AX-YD08) added.

Manual xxxx xxx xxxx.2

- Information on 50 inch HD W2 Plus PDP (S50HW-YD07) added.